

THE TIMES

Dreams of a peaceful revolution: interview with M Giscard, page 12

Two suspended by Lloyds after £33m losses on currency deals

Unauthorised dealings in foreign currencies on the forward market have cost Lloyds Bank an estimated £33m, it was revealed yesterday.

The loss resulted from transactions carried out by Mr Marc Colombo, the dealer at Lloyds Bank International's Lugano branch in Switzerland. Both he and the branch manager have been suspended.

Lloyds Bank has unwound Mr Colombo's transactions and expects no further losses.

Irregularities at Lugano branch

By Ian Morrison, Financial Correspondent

The Lloyds Bank group has incurred an estimated pre-tax loss of £33m as a result of unauthorised foreign exchange transactions by a dealer at its branch in Lugano, Switzerland.

"The position has now been regularised," the bank said yesterday. "All commitments of the branch are of course being met by Lloyds Bank International, which is the international arm of the group."

Mr Marc Colombo, the dealer involved, and Mr Egidio Mombelli, the branch manager, have both been suspended. Mr Colombo has cooperated with the bank in its attempts to reconstruct the events which gave rise to the losses.

According to Lloyds he has confessed to buying and selling currencies on the "forward" market without authorisation and to coining in the falsification of branch records, including the mandatory returns submitted to the Swiss Banking Commission.

The reason for the losses is that Mr Colombo's transactions were "uncovered". In other words, he contracted to buy and sell currencies at fixed prices at various future dates without any certainty that he would then be able to "unwind" the transactions at favourable rates. "Covered" transactions, by contrast, involve dealings on both the "spot" and "forward" markets to ensure that whatever happens to exchange rates during the period of the forward contract, the bank will suffer no loss.

The Bank of England imposes extremely strict limits on British banks' uncovered positions between sterling and other currencies, and Lloyds claims that it only rarely runs an uncovered position between any two currencies.

However, uncovered transactions are a constant source of temptation to a dealer who believes strongly that one given currency is likely to rise or fall sharply in terms of another. If he believes that a currency is going to rise, for instance, he can buy it in Swiss in three months' time, say, at today's forward rate in the hope

Financial Editor and Business Diary

Anger over Labour poster at Rome athletics

From Neil Allen

A poster proclaiming "Britain will win with Labour" was removed from the perimeter of the Olympic Stadium in Rome today on the first day of the European Athletics Championships, by order of Mr Adriën Paulen, Dutch chairman of the European Athletics Association.

The poster, in clear black letters against a white background, was at the end of the back straight, just before the last turn of the track, where it could be clearly picked up by the BBC and ITV cameras as they made their daily coverage of the races.

Before Mr Paulen, obviously furious at the intervention of politics into the sports arena, had ordered the advertisement to be removed it was in view during a heat of the 400 metres hurdles for men featuring Alan Pascoe, the former British athletics champion.

Although the rules of the International Amateur Athletics Federation allow commercial advertising inside stadiums, the federation has as one of its prime objects "to strive to

Games report, page 8

More safeguards for winter holidaymakers

The Civil Aviation Authority is to increase the bond needed for air-travel organizers' licences, to give holidaymakers better protection during the winter season.

Those who are not members of the Association of British Travel Agents will have the minimum level of bonding increased from 10 per cent to 12½ per cent of turnover from October 1. Members must pay a bond minimum of 7½ per cent instead of 5 per cent from the same date.

The bond is a guarantee against a travel agency being unable to meet responsibilities. Holiday deposits, page 2

Business News, page 15

Mr Crosland backs Camden's compulsory purchase of Centre Point flats

By John Young, Planning Reporter

Mr Crosland, Secretary of State for the Environment, yesterday confirmed Camden council's compulsory purchase order on 36 two-bedroom maisonettes which form part of the Centre Point complex in London.

The order was the subject of a public inquiry in January and February, at which the owners, Sennet Investments Ltd, a subsidiary of Mr Harry Hyams's Oldham Estates, objected that the flats were unsuited to the council's needs and that the order was "influenced by prejudiced and partisan motives". It was said that the flats were too expensive for the council and that to separate

Bonn leader in Paris for summit talks

From Richard Wigg, Paris, Sept 2

Herr Helmut Schmidt, the West German Chancellor, arrived here this evening and after driving to the Elysée Palace immediately began talks with President Giscard d'Estaing.

In this third meeting between the French and West German leaders in just over three months the main subjects will be the French President's wish to inject new life into the EEC, and the joint steps which can be taken by the Europeans to overcome their present economic and financial difficulties.

The two will go on through dinner. Herr Schmidt is expected to leave for Bonn in the morning.

Herr Schmidt telephoned the French President after his television broadcast last week and suggested the meeting to find out precisely what the measures were that M Giscard d'Estaing intended to propose on European monetary and economic union again. He is also thought to want to know what the content might be of the discussions envisaged by the French President among the leaders of the Nine on moving towards the realization of European political union.

The French President's strategy is clear. He wants to seize in European affairs the same kind of bold initiative at a difficult political and economic juncture that he has developed successfully in home affairs in his first three months.

No statements are expected after the meeting and nothing of substance about the talks emerges it will be because the other EEC Governments have to be informed first.

Comment today was heavily underlining the shadow of Britain over any kind of European initiative, both because of its present economic situation and because of the expected general election.

France resisted at the two leaders' first meeting in May an offer of massive financial assistance of the kind Herr Schmidt had just accorded Italy. But Paris remains attached to the idea of a general effort through a loan, possibly backed by the Arab nations, to overcome the oil balance of payments deficit problem.

The French President will be anxious to hear from Herr Schmidt about plans to restructure the German economy, which form an essential part of France's export drive plans.

The French Government hopes the German Chancellor will be convinced that its anti-inflationary package has begun to bite.

It is likely that the two leaders will study the European agricultural problem. They may search for common ground for significant reforms so as to avoid the continuing resort to national stop-gap measures.

The French President will be

said the figures should be seen in the context of its pre-tax profits of £7.8m in the first half of 1974 and capital and reserves of £522m at the end of 1973. On the stock market Lloyds Bank shares slumped 18p to 127p.

Lloyds apparently received a strong hint that something was wrong at Lugano about two and a half weeks ago. Mr Colombo came to England and helped the bank to reconstruct the records. Lloyds subsequently received a Bank of England permission to unscramble the transactions and has since worked in close touch with the Swiss National Bank and Banking Commission.

Lloyds' Bank International, which is wholly owned by Lloyds Bank, set up its Lugano branch about five years ago. It is the smallest of the bank's three Swiss branches.

Financial Editor and Business Diary

'Le Monde' calls for Tory victory

Paris, Sept 2.—British electors must vote Conservative at the general election, predicted for next month, if Europe is to move towards closer unity, the independent daily newspaper *Le Monde* said today.

Commenting on President Giscard d'Estaing's call for a stronger Europe, *Le Monde* said: "no far-reaching action can be taken in the Community before the next British election."

"If Labour wins, the Community will continue to exist under a threat from the United Kingdom as long as London has not specified its terms of renegotiations and as long as the British people have not declared their belief in the Community."

Until these matters were cleared up, the Community would live in doubt.

Le Monde said: "As for the management and development of the Community, Mr Wilson, who does not seem to have a well-established European strategy in his head, will squeeze a few advantages for his country, notably in agricultural affairs, and, true to his past, will carry on using this irritating tactic of unavowed obstruction which he has made his own."

"In short, those who still believe in Europe, whatever their own political leanings, have no other choice than to wish the Conservative Party success."—Reuters.

Continued on page 5, col 5

ensure that no racial, religious, political or other kind of discrimination be allowed in athletics." Mr Paulen said: "This has no room in an athletics stadium and must be taken away at once."

"Told it was all right": The poster was paid for by the Labour Party, which rented the seven metres by one metre space through a firm called Special Publicity Projects (a Staff Reporter writes).

Mr Percy Clark, the party's director of publicity, said last night: "We were told by the contractors that it was all right after they had checked with the Italians."

He would not disclose the cost of using one of the eight poster sites round the track. The idea was put forward by Special Projects. The firm, which had worked for Labour before, was a subsidiary of Associated Newspapers, Mr Clark added.

British medals: Tony Simmons, of Britain, won a silver medal in the 10,000 metres, narrowly failing to catch Kuschmann, of East Germany. Joyce Smith, also from Britain, won a bronze medal in the women's 3,000 metres.

Games report, page 8

Business News, page 15



Lord Allen of Fallowfield, president of the TUC, telling delegates on the first day of the congress at Brighton yesterday that no government could take decisions any more without consulting the trade unions first (President's address, page 4).

More union support for social contract is isolating AUEW

From Paul Rouledge, Labour Editor

Brighton

The campaign by trade union leaders to sustain the sagging credibility of the social contract between the TUC and the Government showed concrete results yesterday, but also suffered a setback.

Unions representing more than 750,000 local government workers and miners declined to follow the militant Amalgamated

Union of Engineering Workers (AUEW) into the anti-contract camp; and the Society of Civil Servants, a newcomer to the TUC membership which is not affiliated to the Labour Party, decided to reject the general council's new code for

collective bargaining, although the decision is unlikely to carry great political weight.

Mr Gerry Gillman, general secretary of the society, said: "We are fearful of the impact of the social contract on Civil Service pay. We are worried that it could leave us lagging behind. We shall abstain."

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HOME NEWS

International control of research safety standards urgently needed, Nobel Prize winner says

From Pearce Wright
Science Correspondent
Stirling

The state of research into genetic engineering techniques was likened yesterday by Sir John Kendrew, FRS, giving the presidential address to the British Association for the Advancement of Science's meeting at Stirling University, in the situation in nuclear physics 35 years ago when it was common knowledge among physicists in many countries that the discovery of nuclear fission might make it possible to develop a new source of power or to construct an atomic bomb.

But in his opinion, the present circumstances raised social questions that were more difficult to resolve. There was an urgent need for a permanent international monitoring agency with specialists from the appropriate fields of medicine, biology and law to assess the benefits and dangers of certain types of work. They would draw up safety regulations and specify the conditions of security for public health under which research could be carried out.

Sir John is deputy chairman of the Medical Research Council's molecular biology unit, Cambridge, and was a Nobel Prize winner in 1962.

He spoke of the declining influence of scientists in government, a disturbing indifference and often hostility among the young towards science, increasing stringencies placed on the development of science and research in universities, and other difficulties. He argued that creativity in art and sciences were all of a piece; to be pessimistic about the possibilities of science was to be pessimistic about the potentialities of the human race.

However, Sir John recognized special real or alleged dangers to the human race which might be the consequence of scientific research.

He singled out research in genetic engineering for detailed scrutiny. These are experiments in which genetic material of one organism is isolated and then incorporated with the genetic material of another so that the second organism displays some of the characteristics of the first.

Such events occur under natural conditions when a virus infects an animal cell or another microscopic organism, or when different kinds of bacteria spontaneously exchange parts of

their genetic material. Scientists have used this natural occurrence to develop techniques for investigation into the basis of genetics.

The new situation described by Sir John has come with the discovery of how to carry out such transfers artificially under controlled conditions. It thus becomes possible to isolate genes from the chromosome of one organism and transfer them to another to try to produce a predetermined characteristic.

It has been done with simple organisms already.

The potential medical applications for such processes on the human scale are obvious by supplying missing genes to those suffering from genetic deficiencies. Although the present state of knowledge makes it possible in principle to transfer genes there are enormous difficulties.

There are many different genes in a single animal cell, said Sir John, described the isolation and removal of a particular one as like looking for a needle in a haystack. However, microbiological techniques are improving very rapidly.

He outlined some action which was being taken. A distinguished group of American biologists had publicly proposed a voluntary moratorium on experiments throughout the world until the dangers could be more fully discussed. In Britain the Medical Research Council has called for a moratorium and the Government recently asked the advisory board of the research council to carry out an inquiry under Lord Ashby.

But more was needed. Whatever was done at the national level in this or other countries, there was also a need for a permanent international monitoring body. That body should be international because experiments could be carried out anywhere and there was no time to wait until national control was set up in every country. The only conceivably effective form of control would be a self-imposed one by specialists working in that subject.

Sir John said: "In the gene transfer story we have a clear case where, until it is proved otherwise, it may be possibly dangerous to continue certain lines of research. It may lead us to question scientists' common and generally unspoken assumption that the acquisition of new knowledge is always an absolute good, requiring no justification, no ethical source."

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that in nuclear physics. The present problem seemed more difficult for a number of reasons. The possible consequences of developments in nuclear physics were easier to predict in 1939, than were the possible consequences of gene transfer in 1974.

Owing to the war, nuclear research was carried out entirely within a military framework and was in fact contained within that framework. Gene transfer is more difficult to handle because there is no ring-fence to contain it.

The research can be done by competent people in any laboratory. Furthermore, besides the medical uses, there may be commercial applications and possibly also military ones which increase the spread in terms of number of people and laboratories doing research.

He maintained that carrying out some of the work behind a cloak of military or commercial secrecy, perhaps in several countries, would be doubly dangerous.

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The first squad of woman detectives for Surrey. They are, from left, Gwen Crossman, Mary Dobson, Clare Weedon, Pam Sweetman, Marilyn Fisher, and (rear) Nancy Faull.

Police chief gets writs over pop festival

Mr David Holdsworth, Chief Constable of Thames Valley police, was served yesterday with three writs for damages arising from the Windsor pop festival.

Miss Diana Senior, aged 29, a teacher, is claiming £30 damages alleging the loss of a substantial hank of hair and a severe headache. She alleges that she was assaulted by an agent of Mr Holdsworth "while playing Tibetan bells in a peace-inducing manner".

Mr Nicholas Albery, a youth worker, is claiming £50 for "a bloody nose, sore teeth and a complete lack of faith in the so-called forces of law and order".

His claim alleges that Mr Holdsworth created a riotous situation and disturbed the peace by instructing hundreds of agents to clear the festival site in Windsor Great Park.

Mr Heathcote Williams, aged 23, a playwright, is asking for £35 damages for loss of a sleeping bag, shock and bruising. His claim alleges: "While peacefully meditating on the Holy Name of God, I was assaulted from behind by an agent of the defendant who carried me off by the nose."

The three all come from the Albion free state commune in Westbourne Park Road, Notting Hill Gate, London. The writs were issued at Slough County Court and served by bailiffs at police headquarters at Kidlington, Oxfordshire.

Mr Holdsworth has 14 days to decide whether to contest the action. A preliminary hearing will be at Slough County Court on October 10.

Mr John McKenzie, the three plaintiffs' legal adviser from a group called "Up Against the Law", said: "Hundreds more writs might be taken out against the chief constable. The Release organisation was assembling photographs and film of the police operation and had appealed for witnesses."

Jail and bans for rowdy football supporters

Prison sentences, bans on attending matches, and fines were imposed by magistrates yesterday on football supporters in various parts of Britain.

At Hove, Sussex, two Crystal Palace supporters were jailed for six months for inflicting grievous bodily harm on a policeman. Mrs Olive Dingwall, chairman, called them football parasites.

Roger Poole, aged 20, a warehouseman, of Colliers Water Lane, Thornton Heath, and Gene Rondeaux, aged 23, a metal polisher, of Bennerley Road, Battersea, London, both pleaded guilty to inflicting grievous bodily harm on Det Constable John Atkins.

Mr Adam Proud, for the prosecution, said the two men were among a group of supporters outside a public house near the Brighton and Hove Albion ground on August 17. Shortly before the match against Crystal Palace they hit Mr Atkins as he was about to arrest a youth who had thrown a glass at his car.

Both Mr Poole and Mr Rondeaux kicked Mr Atkins when he was on the ground. His nose was broken and he was still unable to breathe properly. They were ordered to pay Mr Atkins £23 for damage to his clothing. At Bristol Juvenile Court, three boys aged 15 were ordered to miss Saturday afternoon football matches for 12 weeks. The three, all from the Avon area, had admitted using insulting words during the Bristol City and Cardiff match a fortnight ago, when 137 supporters were arrested after the match.

At Birmingham Magistrates' Court, ten supporters were fined amounts ranging from £30 to £100 for threatening behaviour at the Birmingham City ground on Saturday. The situation was described by a policeman as the most explosive he had seen in 23 years in the force. The fines totalled £633.

In the city's juvenile court three boys aged 16 admitted using threatening words or behaviour. One was ordered to pay £25, another £20; a third was ordered to go to an attendance centre for six Saturday afternoons. A fourth 16-year-old admitted a disorderly act after the match and was ordered to pay £10.

Manchester United was asked yesterday to pay for damage that the club's supporters caused to houses in Cardiff on Saturday. Mr George Thomas, MP for Cardiff West, has written to Mr Tommy Docherty, the United manager, contending that it is the club's responsibility to pay for the damage.

South Wales police said that 41 of the 55 people arrested at the match were from South Wales. Only nine came from Manchester.

Twenty-five of the 55 were juveniles, and charges varied from possessing offensive weapons, assaulting the police, wounding and causing criminal damage. All were granted bail to appear in court later.

HP-45 Doubles the power in your pocket

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Pharmacists' plan to cut waste of tablets

From John Roper
Medical Correspondent
Nottingham

A system of repeat prescriptions, which, it is hoped, will cut the quantity of medicine issued to a patient at one time, is likely to be brought in soon, after a meeting of doctors, chemists and Department of Health officials.

Mr Charles Stevens, in his presidential address to the Pharmaceutical Society's annual conference at Nottingham yesterday, said the scheme should eventually spell the end to all overfilled medicine cabinets in the land.

The doctor would still be able to prescribe whatever he wished, but instead of sending a patient to collect, say, a

hundred or more tablets, he would be able to regulate the issue of the total quantity over a month or more. The patient would still make only a single payment, as at present. The scheme would reduce the threat to public safety from large quantities of tablets being kept in house, and unused tablets put away and forgotten. It would cut waste before all the medicine had been taken.

Pharmacists would like to see a phased introduction of the scheme begin within six months. If it were put into operation in one health authority's area the practical problems could be seen and evaluated. The decision lies

with the department. The scheme is an alternative to the present prescription method. No doctor would be forced to operate it.

Mr Stevens said the council of the society would contest vigorously a change in policy, announced by the Medicines Commission last July, on the sale of animal medicines to farmers.

Last year the commission decided that it would be safer if most animal medicines were sold only under the supervision of a pharmacist. That decision had been reversed and, Mr Stevens said, the commission was now prepared to accept a new category, an authorized seller of veterinary drugs.

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HOME NEWS

Thorpe plan to rescue Britain with minimum pay as price of wage control

Britain, with debts accumulating at £4,500m annually, is on her own and can be saved only by unity in adversity, Mr Thorpe, leader of the Liberal Party, said yesterday. Speaking in Brighton, he said:

The message which I bring to the people of this country is not a happy one. Nevertheless it is vitally necessary that we should all be aware of the grave dangers to our economy and democracy which together, we must overcome if this country is to survive.

The stark facts are that we are living beyond our means, the Government is borrowing far more than it can hope to repay; our debts are accumulating to the tune of £4,500 annually and there is no single panacea which can rescue us.

We are on our own and only our common behaviour, as a nation united in adversity, can save us.

How are we to achieve this unity of purpose? Only by squarely recognizing our problems. Some politicians would have us believe that all is well and there is no crisis. All is not well, and they know it. Wherever I go I find people who accept the realities of our situation.

They are not involved in the intricacies of Budget-balancing but they scent the danger when inflation erodes their purchasing power by 20 per cent a year; when the country is constantly crippled with debilitating strikes over exorbitant wage claims; when the Stock Exchange is lower than 30 years ago and firms which represent all that is best in British craftsmanship lie on the brink of bankruptcy.

The British people will not be put off with denial, empty promises of good times to come, or by frankly devious attempts to play off one section of the community against the other. This crisis is real and nothing will be gained by trying to sweep it under the carpet with a general election.

I recall a party leader, who, as Prime Minister, delayed the necessary measures of rearmament until we were on the brink of war with Nazi Germany for which we were ill prepared. In his defence, he later claimed that to preach rearmament to a pacific country would have had disastrous electoral conse-

quences for his government. That man was Stanley Baldwin. I hope that no leading politician in this country will be deluded into playing the same game at the expense of our economic future. We must take action now.

The first thing to do is to end the shilly-shallying over a statutory prices and incomes policy. Why does Mr Wilson say that he will not consider one, and Mr Heath grudgingly admit that it is a possibility of last resort?

Whether anybody likes it or not, the next government will have to introduce such a policy within the next three months. I suggest that the other party leaders should come clean with the electorate and tell them this. For unless they do so, and prepare the measures necessary to gain the acceptance of the whole nation for this policy, it will be doomed to failure.

The attempt by Labour and Conservative governments in 1967 and 1971 were shock therapy and failed because there was no attempt made beforehand to gain national acceptance. To ensure that this is forthcoming, a programme of social reform is necessary, including the following seven points which must be nothing short of a social compact between the people of this country and the government of the day.

1. Provisions for the poor—the 4,500,000 working people who earn less than £25 a week. I want statutory minimum earnings corresponding to the third of the average wage introduced over a three-year period, starting immediately. It means a guaranteed wage of £25 for a normal working week. It means a 3 per cent annual increase in the national wage scale and a corresponding cut in the expectation of those whose earnings. It means, bluntly, that unless we do this, the long, hard winter ahead will leave us with three or four million pauper paupers.

2. I want an immediate commitment from the Government to tie the state pension to a stated percentage of minimum average earnings, as an automatic index against inflation and to ensure that pensioners are not left behind in the wage race.

Time is short and the country is waiting for someone to take a grip on its affairs. If our democratic leaders fail, there are other, less discerning individuals, who will have no scruples about using more painful instruments of repression. We dare not allow them the chance. It is time for action.

Farmers' leaders call on Mr Peart to take steps to relieve livestock producers

By our Agricultural Correspondent

Steps to relieve the difficulties of livestock producers were urged by leaders of the three United Kingdom farmers' unions when they met Mr Peart, Minister of Agriculture, Fisheries and Food, and Mr Hugh Brown, Parliamentary Under-Secretary at the Scottish Office, for two hours at the Ministry in London yesterday.

The farmers' leaders warned Mr Peart that the substantial fall in spendable farm income forecast for the current year would have a very serious effect on farmers' ability to meet home food demand. Decisions were needed now to deal with the crisis in milk, livestock and poultry production.

Sir Henry Plumb, president of the National Farmers' Union of England and Wales, said afterwards: "Our best estimates indicate that unless action is taken spendable farm income will fall by about 50 per cent in the current year and a far greater fall will result in the livestock sector. This will take the farm income situation back to the depressed level of the late 1960s, and in real terms the cut would be substantially greater

in view of the fall in the value of money during the past five years."

The cut in production already shown in a number of sectors would extend further, affecting consumers as well as farmers, farm workers and workers in supply and processing. The danger could be averted only by a substantial cash injection this autumn.

The minister said he recognized the importance that the farmers' unions attached to action during the autumn, but he hoped that it would be possible at the meeting of European farm ministers in Brussels today to clear the ground for further decisions by the Council of Ministers on September 23 and 24.

Among points pressed by the unions was an increase in the guide price for beef to take account of the true value of the pound relative to the EEC unit of account; the present scheme of direct payments should continue with further supplementary payments if producers' average returns fail to reach the adjusted intervention price.

They called on the minister to make clear in Brussels that the beef support system should be overhauled for next year, with the institution of a

premium payment scheme, reinforced by guaranteed minimum prices in countries that did not wish to implement intervention. There should be a substantial immediate increase in the guaranteed price for milk, direct payments for pigs must be extended, and the real value of the pound must be used in determining those payments.

They also pressed for some protection of the egg market from imports at unduly low prices from the Continent, particularly France, which excluded our egg exports, and asked for consideration of a system of headage payments to producers to meet their immediate problems.

Orkney "crisis": Mr Grimond, Liberal MP for Orkney and Shetland, and Mr Jack Tait, president of the Orkney National Farmers' Union, sent a telegram to Mr Peart yesterday saying: "Urgent realistic guaranteed prices be introduced at once. Crisis in Orkney and Shetland. Fat cattle around £15 at Kirkwall. No sale for Shetland lamb to Aberdeen" (our Orkney correspondent reports).

Mr Grimond said: "I was at the Kirkwall mart this morning, where prices for fat cattle were over £2 below the inadequate minimum set by Mr Peart himself."

Tories will back independent aero industry

By Arthur Reed
Air Correspondent

On the eve of the visit to the Farnborough Air Show today of Mr Benn, Secretary of State for Industry, Conservatives came out strongly against the proposed nationalization by Labour of the British aircraft industry.

Mr Kenneth Warren, chairman of the Conservative parliamentary aviation committee, and Mr Eldon Griffiths, shadow Minister for Trade, in a letter to Sir Harry Broadhurst, president of the Society of British Aerospace Companies, said: "All experience shows that nationalization would not improve the industry's efficiency or level of production, but that it would blunt its competitive edge.

"Nationalization would add enormously to the taxpayers' expense, while providing no more security whatsoever for the industry's work force."

The letter said that a Tory government would stand by the industry in honouring its export contracts. It would seek to improve the use of the government research establishments to advance the state of the art in British aeronautical engineering, and in particular it would encourage a big effort to reduce aero engine noise.

"Too many people have suffered far too long from noisy aircraft. We are confident that Britain's aeronautical scientists and engineers can meet this challenge quickly," it said.

Mr Benn is due to tour the Farnborough Show this morning and will fly in the Lockheed TriStar airbus powered by the Rolls-Royce RB211 engine.

Resolution lists conditions for wage restraint

Continued from page 1

The general council yesterday nodded through two resolutions on economic policy and the social contract, and decided without a vote to recommend delegates to reject military.

The decision was taken with AUEW leaders present, but they did not speak. It suggests that the AUEW will be supported only by Civil Service unions with a combined membership of about 300,000 and a few other white-collar unions, including the journalists. Mr Wilson will thus be able to claim on Thursday, when he addresses the congress that the unions accept voluntary pay restraint in a ratio of about four to one.

After the psychological shock of the engineers' strike, it appears the situation has set in. The militant train drivers and the Association of Scientific Technical and Managerial Staffs (ASTMS) have hesitated over the issue and will not make up their minds until today or at the end of the debate. Others, like the agricultural workers are taking the classical trade union way out of voting for everything.

An attempt by Mr Jack Jones, general secretary of the Transport and General Workers' port, to get the engineers to reconsider their line got nowhere yesterday. The AUEW leaders, traditionally jealous of trade union autonomy, did not then listen politely to the expression of hope that the unions should line up solidly behind the social contract.

The anti-contract resolution being proposed by the technical and supervisory section of

are AUEW and seconded by the Civil and Public Services Association, declares that a social compact can be accepted by trade unionists only when "substantial progress" has been made on eight points in the "alternative strategy" of the TUC-Labour Party liaison committee.

The demands, described by Nalgo as "pie in the sky", are for a big redistribution of income and wealth; a vast increase in house building, particularly for the low-paid; municipalization of state housing land; wide-ranging and permanent price controls; vastly improved social services; more public ownership and state supervision of private corporations' investment policies; and big cuts in defence spending.

Ranged against that policy, which will attract only about a quarter of the 10 million congress votes, are two more generally worded resolutions. The first, on the social contract, promises full support to efforts made by the TUC and the Government to end the long-standing dispute over the economy, and reiterates the TUC's faith in free collective bargaining.

The second resolution on economic policy, welcomes the abolition of the Pay Board and calls for a "progressive economic policy" covering prices, profits and all kinds of income. It declares that any future policy affecting income must be preceded by "adequate prior consultation within the TUC".

These two resolutions will be overwhelmingly endorsed.

TRADES UNION CONGRESS

Civil servants' leader threatens industrial action as unions vote to campaign against private agencies

From Our Parliamentary Staff Brighton

A composite motion calling for a campaign to end the use of the public service of staff recruited from private fee-charging employment agencies was carried without dissent on the opening day of the Trades Union Congress in Brighton yesterday.

This should be accompanied by a far greater degree of austerity and care in the deployment of public money.

4. The indexation of savings and equity bonds against inflation to protect those dependent on their investment.

5. A careful reappraisal of the prospects for investment with the Government through the NEDC (National Economic Development Council), initiating a series of investment in major sectors.

6. A commitment to legislate, in the next session of Parliament, to restructure industrial relations on a copartnership basis. The legislation should be mandatory, but not necessarily rate specific.

7. Further consideration, particularly to help the first-home buyer to overcome the twin problems of escalating house prices and high interest rates, will be an end to bidding up the market and to end inflation through subsidizing the building societies. We should be far more selective in the money which we hand out for house purchases.

8. The motion reaffirmed the union movement's opposition to private fee-charging agencies, deployed their "parasitic nature", and recorded

concern at their effect in undermining union bargaining strength.

It also expressed concern at the ineffectual nature of the Employment Agencies Act, a private member's measure, and called for fresh legislation to comply with the International Labour Organization's convention on abolishing agencies.

It asked the general council to use TUC industrial committees and to create ad hoc machinery for the public sector to end the employment of agency staff in the public service.

MR GLYN LLOYD, of the Union of Construction, Allied Trades and Technicians, who moved the motion, said that the fee-charging agencies worked on the principle of "live today, pay tomorrow". Collective bargaining meant nothing to agency staff, and good industrial relations could not be maintained

in the building industry when directly employed craftsmen received far less than those using the services of agencies.

The trade union movement was resolutely opposed to the continuing existence of the agencies and they would no longer tolerate them living off the backs of the people the movement represented.

Mr Kendall said that the draft regulation Mr Foot, Secretary of State for Employment, had presented to the general council as a "reasonable alternative" to abolition of the agencies was nothing of the sort.

He believed Mr Foot's action to be a marginal perversity of understanding rather than a departure from the draft regulation.

The motion was passed by a majority of 1,000 to 1,000.

Dealing in human bodies continued to be as attractive as in the days of the slave trade, and

it was no wonder that the number of agencies was about 3,000. Agency staff made no contribution to the organized trade union movement.

Miss Audrey Prime, of the National and Local Government Officers' Association, said that her union's main objection to the agencies was that they undermined the state employment service, which was being reorganized.

It was essential that the manpower Commission, to which the service was to be transferred, had to be reorganized. That was not remotely possible unless the private agencies were abolished.

Mr B. Dix, of the National Union of Public Employers, said that a Federation of Personnel Services had begun distributing press releases showing what a socially useful service private agencies were doing, particularly in the National Health Service.

Most agency employees were in the "push" teaching hospitals, he said. Now many agency staff did one set in geriatric and psychiatric hospitals.

Mrs Christine Page, of the Union of Shop, Distributive and Allied Workers, said that half the 5,000 agencies were not even covered by their own professional employers' organizations.

These were the ones most likely to deal in "lump labour".

The agencies' total turnover was about £45m a year and the number of people they employed varied between 50,000 in the winter and 90,000 in the summer. Last year, two-fifths of all office staff was placed by agencies, as compared with 7 per cent placed by the employment service.

Her union was opposed to the agencies because they were inflationary.

Diary, page 12
Leading article, page 13



Faces at the congress yesterday: From the top, Mr Len Murray, TUC general secretary; Mr Richard Brightshaw, of Natsopa, and Sir Sidney Greene, of the railwaymen; Mr Alan Sapper, of the cinematograph technicians, and Mr Kenneth Gill, of the engineering workers.

Communist gets seat on general council

From Alan Hamilton Labour Staff

Election results for the TUC General Council were declared today will show a pronounced swing to the left, with the communists capturing a seat for the first time in a decade.

The demands, described by Nalgo as "pie in the sky", are for a big redistribution of income and wealth; a vast increase in house building, particularly for the low-paid; municipalization of state housing land; wide-ranging and permanent price controls; vastly improved social services; more public ownership and state supervision of private corporations' investment policies; and big cuts in defence spending.

Ranged against that policy, which will attract only about a quarter of the 10 million congress votes, are two more generally worded resolutions. The first, on the social contract, promises full support to efforts made by the TUC and the Government to end the long-standing dispute over the economy, and reiterates the TUC's faith in free collective bargaining.

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These two resolutions will be overwhelmingly endorsed.

Government decisions must take heed of voice of labour, Lord Allen says

From Alan Hamilton Labour Staff

Governments could no longer afford to take any decisions without first hearing and heeding the voice of the organized trade union movement, Lord Allen of Fallowfield, president of the TUC, said in his opening address to the 106th congress in Brighton yesterday.

Both the Government and the TUC carried a great responsibility for the future economic course of the nation, and neither side could afford to ignore the long-term implications of failure of the "social contract".

The most important task facing the trade union movement was to convince the people who ran industries that the social contract could work and must be made to work.

The Government, he said, had driven under the wheel of the social contract, and had often found itself frustrated because of the shifting, vacillating, hollow alliances of small groups in opposition basing in a false sense of power. He singled out Aims of Industry for particular criticism.

In this situation all of us, without exception, must be aware of the influence we collectively bring to bear on the major current political and economic issues confronting us.

Lord Allen said that the climate of the last general election—but can there be agreement between them on aims and objectives?

"Common commitment by all in our current situation is the best way I know, indeed the only way, of retaining our independence and freedom from external restraints."

Referring to the responsibility that the social contract placed on both sides, he said: "As long as the guardianship of the social contract remains in its present setting, to dismiss it as being too daunting, or because it is easier to be critical

of the present setting between the Government and the TUC, is to accept that there will be no increase in unemployment", he said, "but we believe in being prepared. We would be expecting quick action by the Government to counteract any possible increase in unemployment if it began to show throughout the country."

The TUC's report on employment developments, he said, had been much concerned during the past few months to prepare plans against the possibility of a rise in unemployment.

"That does not mean that we accept that there will be an increase in unemployment", he said, "but we believe in being prepared. We would be expecting quick action by the Government to counteract any possible increase in unemployment if it began to show throughout the country."

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WEST EUROPE

French Government seeks public's help to fight price rises

From Richard Wigg

Paris, Sept 2

M. Fourcade, the Economics Minister, today launched "operation price brake", the Government's instrument to mobilize public support in combating rising prices.

It represents the popular propaganda arm of the Government's anti-inflationary package whose most significant measures are the bank credit squeeze, prompter payment of company and personal taxes, reduced fuel imports and at the European level attempts to harmonize the financing of the balance of payments deficits created by the rise in oil prices.

An estimated 150,000 to 200,000 of France's almost 500,000 commercial outlets today displayed in their windows—more or less prominently according to their enthusiasm—the "boxed-down" pointing arrow, the badge of the campaign.

M. Fourcade goes on television tonight, assisted by Mme Françoise Grouet, the State Secretary for Female Affairs, to coax shoppers into relearning the virtues of critical shopping around, forgotten in recent boom years.

Over the next three months 40 articles of popular consumption will in turn be sold at 5 per cent below the prices prevailing on July 31.

This month is the turn of schoolchildren's clothes and shoes, schoolbooks and equipment, and some foodstuffs like cheese, margarine, ham, sausages, yoghurt, coffee and ordinary table wines.

Next month it will be the turn of household goods and in November of winter clothing for adults.

As the campaign began it

became clear that the big stores and the supermarket chains were seizing on it to attract big orders. One famous Paris store has promised to sell its goods at autumn, 1973, prices. Small shopkeepers' leaders have been far more reluctant to tell their members to take part.

France's official cost of living index, at July 31, was 14 per cent up on the previous year, with a rise of 1.3 per cent in the last month. M. Fourcade's experts have calculated that, even if all the shopkeepers collaborate, the campaign will bring prices on the official index down by only 1 per cent in the period to the end of the year.

M. Georges Seguy, the Secretary General of the Communist trade union confederation CGT, broadcasting on television last night, offered to negotiate with the Government on a five-point programme to "throttle back" rising prices.

M. Seguy required, however, the freezing of prices of certain popular food items, together with the reduction, or suppression, of the value-added tax.

Moreover he demanded guaranteed purchasing power for workers and pensioners, based on a new official cost of living index.

His relatively mild tone has pleased the Government as has the pledge by M. François Ceyrac, president of the Patronat, the employers' organization, to collaborate over the anti-inflationary package.

The test will come quickly, tomorrow sees the beginning of negotiations between employers and unions on security of employment and

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OVERSEAS

Frelimo and Portugal to begin formal talks in Lusaka this week on independence

Dar es Salaam, Sept 2.—The Mozambique Liberation Front (Frelimo) and the Portuguese Government will begin formal negotiations this week to agree for power in an independent Mozambique. The negotiations in Lusaka, beginning on Thursday, will set a date for independence and work out the "quickest mechanism" for handing over power to a Frelimo Government.

The President of Frelimo, Mr Samora Machel, told a press conference at his Dar es Salaam headquarters today that he was confident the peace talks to end the 10-year-old guerrilla war and 500 years of Portuguese rule would be successful.

The Lusaka meeting is the climax of three months of contacts between the two sides which, according to informed diplomats in the Tanzanian capital, laid the groundwork for independence and a new administration in Mozambique.

The diplomats said basic agreement on the principle of an independent Mozambique had been worked out three weeks ago at a secret two-day meeting in Dar es Salaam between Mr Machel and Dr Mario Soares, the Portuguese Foreign Minister.

They said the Lusaka conference could be relatively short, merely to give formal ratification to a new constitutional framework that had been agreed already. Senior Tanzanian

Government officials reported last week that agreement in principle on important issues was reached last month in Dar es Salaam. It was now a question of "dotted the 'i's and crossing the 't's".

The diplomats also pointed out that five days after the Lusaka negotiations begin Dr Soares, who has represented Lisbon in all earlier talks with Frelimo, is due to be in Guine-Bissau for the country's independence ceremony on Sept 10.

Announcing the forthcoming talks today, Mr Machel said: "Frelimo is going to Lusaka with an open mind and spirit, conscious of the responsibilities it will assume. We are sure the people of Mozambique are already prepared to rebuild their nation over the ruins of the old."

"We are not going to negotiate independence. Our object is to establish the way power will be transferred to Frelimo and this corresponds with the interests of the peoples of both Mozambique and Portugal."

Mr Machel said the people of Mozambique, under the leadership of Frelimo, were preparing to assume the responsibilities of a new nation to be formed soon.—Reuter.

Lourenço Marques, Sept 2.—A Frelimo guerrilla leader arrived in northern Mozambique today. A radio announcement said Mr Gulamo Eche arrived

Sikkim chief minister denounces ruler

From Michael Hornsby
Delhi, Sept 2

The controversial Constitution (36th Amendment) Bill, which provides for Sikkim's association with the Indian Union, was today introduced in the Lower House of the Indian Parliament, by Mr Swaran Singh, the Minister for External Affairs.

Frelimo representative Mr Leonardo Jacob told a weekend meeting: "All Mozambicans have the duty to work for the progress of the country. Strikes are caused by our enemies."

Frelimo denied being responsible for a rash of military incidents in the past few days. In the most serious, two power lines linking the Cabo Bassa dam and South Africa were blown up. It was the first time the lines had been sabotaged since they were completed a year ago.—UPI.

Lisbon, Sept 2.—Portugal and Senegal have established diplomatic relations and Dr Soares forecast that other African and Arab countries, as well as India, would soon do the same.

A Foreign Ministry spokesman said Portugal had established relations with Senegal at ambassadorial level with immediate effect. Senegal is the first African country to establish relations since Portugal's moves towards decolonization.—Reuter.

Brigadier in Salisbury to start new job

From Our Correspondent

Salisbury, Sept 2

Brigadier John Probert, a former British Army officer who served with the occupation forces on the Rhine, has arrived in Salisbury to take up his post as chief executive officer of the city.

At \$18,000 (about £12,000) a year he is the highest paid official in the city. He will in effect be Salisbury's "general manager".

Security forces have killed another five guerrillas in the north-eastern border area, security force headquarters announced today.

The Rhodesia Group, the right-wing organization led by Mr William Harper, a former Cabinet minister, is to become an official political party, a spokesman indicated today.

Kashmir parties turn down Pakistan plan

From Our Correspondent

Rawalpindi, Sept 2

A formula for the Pakistan part of Kashmir (Azad Kashmir) adopted at the behest of the Pakistan authorities by the Azad Kashmir Assembly last week has been repudiated by the Kashmir Liberation League. The League was once believed to be closest in its political views to Shaikh Muhammad Abdullah, the Kashmir leader reported to be working out a new constitutional arrangement for Kashmir with the Indian Government.

The Kashmir Liberation League is the second Kashmir political organization to express its resentment over the new constitutional formula for Azad Kashmir. The Azad Jammu and Kashmir Muslim conference have also rejected the formula as contrary to the agreement reached on June 10 between the Kashmir political parties and Mr Bhutto, the Pakistan Prime Minister.

Mr Bhutto and his ministers are reported to be planning to meet the Azad Kashmir People's Party's central committee soon.

Khrushchev bust by 'donkey tail' sculptor

Moscow, Sept 2.—The only monument in the Soviet Union to Nikita Khrushchev, the former Prime Minister, was placed in a Moscow cemetery today.

The granite monument, topped by a bronze bust, is in Novodevichy cemetery. The third anniversary of Mr Khrushchev's death at the age of 77 in 1971 occurs on September 21.

Mr Ernesto Gómez, aged 49, a sculptor and Mr Khrushchev's son, Sergei, aged 39, supervised the work. Mr Khrushchev once said of the sculptor's abstracts: "A donkey with his tail could do better work."—UPI.

Photograph, page 14

in northern Mozambique to brief both local Africans and white settlers about his group's political aims for the future. He met local tribal chiefs today.

The diplomats also pointed out that five days after the Lusaka negotiations begin Dr Soares, who has represented Lisbon in all earlier talks with Frelimo, is due to be in Guine-Bissau for the country's independence ceremony on Sept 10.

Announcing the forthcoming talks today, Mr Machel said: "Frelimo is going to Lusaka with an open mind and spirit, conscious of the responsibilities it will assume. We are sure the people of Mozambique are already prepared to rebuild their nation over the ruins of the old."

"We are not going to negotiate independence. Our object is to establish the way power will be transferred to Frelimo and this corresponds with the interests of the peoples of both Mozambique and Portugal."

Mr Machel said the people of Mozambique, under the leadership of Frelimo, were preparing to assume the responsibilities of a new nation to be formed soon.—Reuter.

Lourenço Marques, Sept 2.—A Frelimo guerrilla leader arrived in northern Mozambique today. A radio announcement said Mr Gulamo Eche arrived

Lack of crèches holds up work on Siberian dam

Moscow, Sept 2.—Work on a huge hydro-electric power dam in Siberia is being held up by a shortage of baby crèches, as well as concrete mixers and skilled hands.

Construction of the Sayanskaya-Shushinskaya dam on the Yenisei river some 300 miles south of Krasnoyarski, is lagging as workers join, then melt away.

One reason is that industrial planners calculated on only one child to each five families in the workers' settlement which has mushroomed round the work site. But today almost 800 children are waiting for admission to non-existent nursery schools, kindergartens and crèches, according to the newspaper *Sovetskaya Rossiya*.

Workers on the site have already celebrated the tenth anniversary of the start. Young boys and girls who came here 10 years ago are married already—and there is no longer one child for five couples", the newspaper writes.

Apart from labour shortages and housing problems, site planners have also to face the problem of unskilled cement-mixing teams and a defective new mixing machine.

"Laboratory analysis shows that the quality of concrete is not high—not only due to unskilled workers but also due to machinery... New mixers were bought. Within a month they made a pyramid of scrap metal."

There is a shortage of flats and 1,500 people are still on the waiting list. Almost 800 children

are queuing for admission to kindergartens and nursery schools.

"There is a shortage of medical units—especially hospitals. There are not enough shops or canteens."

Work force migration could have been less if planners had provided more canteens. "In the past six months, 1,500 workers arrived, and 700 left. The workers have to queue for half an hour to get their lunch... There is only one canteen for several groups of construction workers, and one buffer for the rest."

Judging from scattered references in the Soviet press, completion of the dam is now planned for 1980. But by 1978 there will be a power gap in this region of Siberia equal to the ultimate output of the new dam, *Sovetskaya Rossiya* says.

When completed, the dam, with an output of 6,300,000 kilowatts, will dwarf other Siberian plants.

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Judging from scattered references in the Soviet press, completion of the dam is now planned

ENTERTAINMENTS

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OPERA AND BALLET

COLISEUM 101-256 3161
ENGLISH NATIONAL OPERA
TOMORROW AT 6.30: DON CARLOS
TOMORROW AT 7.30: LA BOHÈME
BUTTERFLY. Thurs. 5 Sat. 7.30.
LA TRAVIATA. Thurs. from 5.30.
SADDLER'S WELLS THEATRE: ROMEO
AND JULIET. Thurs. 5 Sat. 7.30.
BAT-DOK. DANCE COMPANY OF ISRAEL.
SNAPE MALTINGS.

CONCERTS
Proms 74. Royal Albert Hall. (389)
English Opera Group in
CHAMONIX. Thurs. 5 Sat. 7.30.
GILBERT & SULLIVAN'S "Trial by
Fool". Festival of Old Music. Aldwych.
Suffolk Tel. 071 885 2630.

THEATRES

ALBERT 856 3878. Evening 8.
Sat. 6.15. Mat. Thurs. 3.
DIA 856 3878. Mat. 7.30.
PYGMALION
Director John Dexter.

AMBASSADORS. 856 1274. Reduced
price. Tues. 5 Sat. 7.30. Opens
TUESDAY.

JACK THE RIPPER
A new musical. Public Dress
Theatre. 10.30. Sat. 7.30.

AMBASSADORS. THE MUSSETTE
Transferred next door to St Martin's.
APOLLO. 457 2263. Evening 8.0.
MARTHA. Tues. 5 Sat. 7.30.
DEREK NIMMO
SUPER-CLOWN. -D. Express

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WHAT'S NEW FOR BABY? 2.
Derek Nimmo is gentle, tender, very
funny and extremely touching.
warmly recommended. -D. Times

NOW BOOKING UNTIL XMAS
CAMBRIDGE. 826 6066. Reduced price.
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A MIRACULOUS COMPANY. People.
Last five days.

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BRIAN RIX JIMMY LOGAN
A BIT BETWEEN THE TEETH
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CASPER. 856 3878. Comedy. Sat. 7.30.
TWIGGY STEPTON & SON
WILFRID BRADBELL.
Postal Savings Box Office
opening September 9.

CHICHESTER. 826 8233. Tonight.
GODFATHER TYRANNUS. Sat. 7.30.
TICKET. 856 3878. Sat. 7.30.
THE COUNTRY.

COCKTALES. 826 5091. Last 5 days.
THE CHILDREN'S CRUSADE
COMEDY. 856 3878. Evening 8.0.
WHAT IS YOU?
DIED TOMORROW
by DAVID WILLIAMS.
Comedy. Sat. 7.30.

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ALAN AYCKBOURN'S
ABSURD PERSON SINGER
BEST COMEDY OF THE YEAR.

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MICHAEL CRAWFORD IN
BILLY.

A NEW MUSICAL.
CRAWFORD'S ASTONISHING TALE
OF LONDON. NO RESIDENT OR
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LIFE CLASS
Directed by JOHN ANDERSON
A BRIGHT SPOT. Times.
LAST 3 WEEKS.

FORTUNE. 856 2236. Evenings at 8.0.
THE NIGHT OF THE AYCKBOURN.
THE NIGHT IS STUNNING. 8.0.
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Evenings 7.30. Mat. 8.30.

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THE CONNECTION
Jack Colins.

HAYMARKET. 826 0830. Evenings 8.0.
STANFORD'S. Sat. 8.30. MONTAGUE
STORY. 856 8108. Mon. to Fri. 8.0.
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HER MAJESTY. 930 6606. Even.
BUTTERFLY. 856 8108. Mon. to Fri.
TOM COURtenay in
THE NIGHT OF THE AYCKBOURN.

LIVING TOGETHER. 856 8108.
TOM COURtenay in
THE NIGHT OF THE AYCKBOURN.
MON. to Fri. 8.15. TABLE MANNERS
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SOPHOCLE'S "PHYLLEUS".
HAMPTON THEATRE CLUB 722 3501.
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TODAY. 7.00. Mat. 8.30. Dinner
KING'S ROAD THEATRE. 728 7478
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BIST MUSICAL OF THE YEAR.
EVENT. Standard DRAMA AWARDS.

LAMDA THEATRE. London. 375.
On the life of Marlowe. This is the only
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JOHN PAUL, GEORGE, RINGO
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HUGELY ENJOYABLE. Times.

LYRIC. 827 3466. Even. 8.0.
Nat. Wed. 3.0. Sat. 6.30 & 8.30.

COLE.
Wrote and music. COLE PORTER.
Apostle musical entertainment in town.
Only Mat. "Delightful, delicious".

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CAT. "A MAGICAL" 8.
TWEEDLEDEE REVUE. -G. Gardner.

NEW LONDON. 308 0072. Parker St.
Dinner. 8.15. Sat. 8.30. Sun. 8.30.
RAMY CANN. Prove. Sat. 9.10 & 8.30.
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SANTO JOAN. 856 8108.
Airing. 8.30. Sat. 8.30 & 9.30.
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OLD VIC. THE NATIONAL THEATRE.
1927 7616. TUESDAY 7.30.
EQUUS.

TOMORROW. 7.30. Thurs. 8.15 & 7.30.
THE MARRIAGE OF ANTONIO. 8.0.
TUES. 8.15. Sat. 8.15 & 7.30.
SPRING AWAKENING.
SEATS ALWAYS ALMOST FULL.
DAY OF PERFORMANCE. 8.00-10.00.

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OXFORD THEATRE FESTIVAL. 0845 342444
Evenings. 8.00-10.00. Sat. 8.00.
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SPORT

Athletics

Pascoe lifts Britain's depression

From Neil Allen
Athletics Correspondent

It was a worrying first hour for British athletes when the 11th European Athletics Championship opened here this evening in some times stifling heat and humidity. Britain's hopes of a large haul of 70 was whitewashed down slightly, including the elimination from the women's 400 metres of the British record holder, Donna Murray.

Poor Miss Murray, only 19, finished fourth in a heat of the 400 metres and then had to wait some 20 minutes outside the stadium before a colleague from the next heat had the time of 53.6sec., which does not bear comparison with her British record of 51.8sec., was not enough to qualify her for the semi-final round. No wonder she ran off in tears.

It was not all depression for the British team, for Leyley Kieran, 17 only last month, survived her heat to the 300 metres for the next round, thanks to the time of 2m. 2.8sec., which was just passed forward. I was especially delighted for her after the worry she had experienced in battling to achieve the European qualifying time which guaranteed her a place in the British team.

The build-up to this first day was even more agonising for the 400 metres hurdler, Alan Pascoe, because of a hamstring injury which made the selectors seriously doubt whether he would fit enough to compete in all. Pascoe today, however, got through his first round heat after looking half-way through, as if he were carefully feeling his way back into this demanding event for which he has been one. Europe's best man.

As the heats finished, so did for Britain's athletes and saw some, like Donald Halliday, in the 100 metres, and Stephen Marlow, at 400 metres, fall far below their usual standard, it was pleasing to see Russia's double Olympic sprint champion, Valeriy Borzov, return to defend his Continental tides in



Borzov, the Russian Olympic champion who has been off form, wins his heat of the 100 metres.

heats of the 100 metres. Borzov with his upper body relaxed, sure that he will be through for the semi-final. In the previous heat young men who entered wearing only shorts made from the Union Jack.

The atmosphere of the first part of the week's programme had its own Roman flavour, not only because of the weather, but the frequent outbursts of shrill whistling which came from the stands where Italian teenagers expressed themselves forcefully against anything which they thought seemed to smack of authoritarianism by officials. There was plenty of cheerful shouting exchanged between them and the young sup-

porters from other countries and plenty of derision cast at two young men who entered wearing only shorts made from the Union Jack.

As the sun at last disappeared and the floodlights came on, the results of the various heats began to trickle through, sometimes as much as 25 minutes after the event. The results were not surprising, the organisers got into the necessary rhythm for presenting a complex sport.

The stadium of some 80,000 capacity was about a quarter filled, though the enthusiasm made one forget the empty spaces

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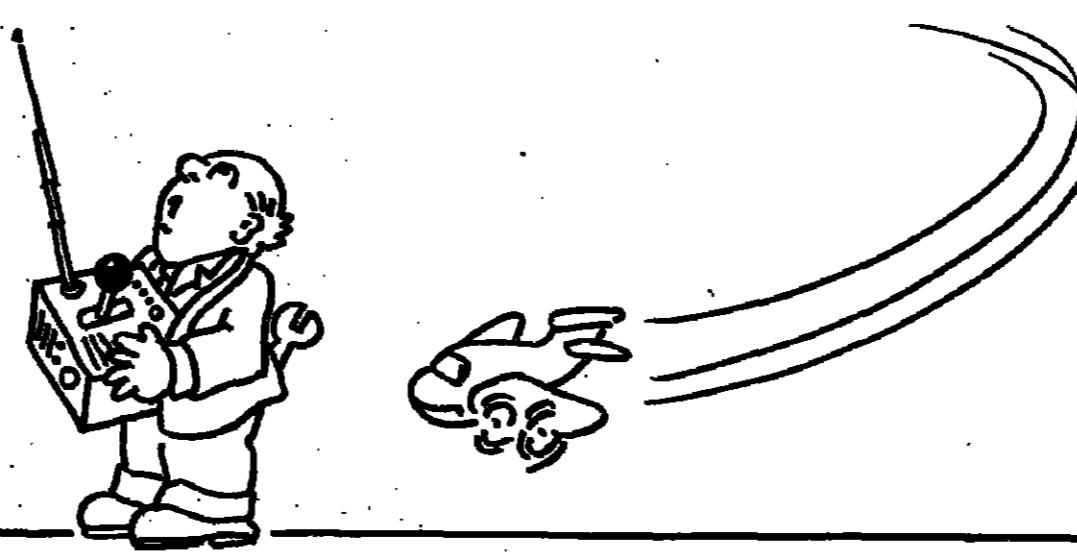
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Aerospace electronics

Freedom from government control means lively competition

by Arthur Reed
Air Correspondent

The United Kingdom aerospace electronics (avionics) industry goes to this year's Farnborough Show in a buoyant mood in spite of the inevitable, deleterious effects upon it—as upon the rest of British aerospace—of the world energy crisis.

Avionics are probably better able to resist such pressures because their products are forming an increasingly large percentage of aerospace needs at the years pace. At the moment they are estimated at one-third of the cost of any new aircraft, but this proportion will inevitably increase as the reliance of the aviation industry upon avionics becomes greater, and the products themselves become more and more complex.

This increasing content in aircraft, whether civil or military, and in their attendant ground facilities, from air traffic control to instrument landing systems, means that the avionics industry has been able to occupy a more important place in the counsels with government which lead up to new projects and a better say in the way in which those projects are managed.

Until recently the industry found itself, with little say. It was frequently presented with a fait accompli by the civil servants who drew up guidelines for new projects with little or no recourse to the thinking and capabilities of the individual companies which make up the avionics on other projects and sub-contract work to each other.

Today relations with the various government departments have been affected to a significant degree by world forces over the past 12 months, in particular galloping inflation and the effect on airlines and military aircraft operators of the energy crisis brought about by the October war between the Arabs and the Israelis.

A further aggravation was the series of industrial disputes which affected the whole country early this year and which made its impact on avionics at a time when their order books were highly satisfactory.

A far larger proportion of the government—appropriated research and development funds for avionics should be channelled to the industry's own laboratories rather than to those of government establishments, such as RAE, Farnborough.

Although it does rely on public funds for a great deal of its research and development, avionics in the United Kingdom still finances much of its own work in this sector as private ventures. It is a form of funding now almost unknown in the expensive airframe and engine sectors of British aerospace, and this ability to be completely commercial and free to a major degree from government control makes inevitably for a very lively and competitive industry.

Firms within the Electronic Engineering Association do, in fact, compete among themselves on similar projects, but at the same time they often collaborate seriously, with more than 120 different products listed for the whole industry via display, many of them in at least two satellites placed in orbit, one over the Pacific and one over the Atlantic.

Executives of the British

industry react, however, by pointing out that the United States participation will allow them to see at close quarters and all under one roof just what the main opposition is doing. They point out that, even though the British industry does not have the complete capability of their transatlantic competitors, particularly in the space and rocketry sector, they have sold a wide range of their products into America and are a force to be reckoned with there.

Meanwhile, the British industry believes itself to be well established to sell its many successful wares developed in the past, while being embarked on numerous very promising projects for the future—among them improvements to instrument landing systems to make them less subject to interference from buildings and local traffic.

Despite these objections, the European Space Research Organization (ESRO) has the funds, and is going ahead with its plan.

Further busy markets for their products are foreseen by the industry in the oil exploration industry, with a growing need for communications and navigation equipment for helicopters, in equipping the new generations of wide-bodied airliners and supersonics and their attendant ground facilities, and in updating existing and Third World airports to the demanding standards of the United Nations aviation body, the International Civil Aviation Organization (ICAO).

This latter project has become a temporary victim under a change of the rules by the Society of British Aerospace Companies.

There are indications that the American industry is taking Farnborough very seriously, with more than 120 and communications systems for the whole industry via display, many of them in at least two satellites placed in orbit, one over the Pacific and one over the Atlantic.

as public purchasing might have a more significant effect.

The airlines contend that the slowing down of their traffic brought about by higher prices for aviation fuel and the resultant need for higher fares, the carriage of more people in fewer, larger airliners and the rapid development of on-board navigation systems, have conspired to make aero-satellites unnecessary at present. Communications, they add, can still be carried successfully on the traditional high frequency radio bands.

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by J. W. Sutherland
Managing director
Marconi Radar Systems

It is recognized increasingly that electronics in many forms is a major high-technology element of what is loosely defined as aerospace and that not only are techniques, applications and the scale of activity advancing now, but the executives do not rule out closer integration if it comes on purely commercial lines.

Memories of British companies emerging second best in competition for avionics contracts for the European multirole combat aircraft (the MRA) to West German firms—backed by the United States—and Italian companies, die hard, while there also remains a strong feeling that much British avionics skill has been handed over to the continentals in past joint projects.

Despite these old wounds, British avionics may be expected to collaborate more fully with the European industry in future as the French and the West Germans begin to match the across-the-board capability of the industry in this country.

But deals will be done on a commercial, rather than a political basis, the major object of the EEC countries will help on a government-inspired basis, being to keep the volatile

business not yet clear. According to the latest report of the Electronics on the Continent where Engineering Association, they already have a firm first year—1973—in the foothold through their Community had little direct effect on business although and military aircraft, and there were longer-term strong links with German signs that the policies of the French and Italian companies in such things as.

advanced hardware can be doubly beneficial to the nation: first in providing the complex defence capability which is necessary to fulfil our obligations to our partners and to give the country a military credibility; and second, in providing the stimulus to export by generating further investment in research and development and helping to sustain an industry on the scale necessary to compete in the world. This dual value is particularly appropriate in electronics.

It is sometimes argued that defence spending will stimulate exports by releasing capacity; the opposite has been the experience in the past decade or two. Taking an even more fundamental view of the economic situation, it is apparent that our survival as a trading nation depends on the most effective use of our own inventiveness, skill and ingenuity. It would be seen that the sector of British industry in which these qualities can be most used, fully deployed is in electronics in general and aerospace in particular.

Electronics is an industry of outstanding benefit to the economy because it can react quickly to technological change, the consumption of imported raw materials and fuel is fairly low, and the capital investment necessary to sustain a thriving business is within normal corporate means. Above all, the situation in the aerospace market place could not itself represent a loss of business directed to high technology which has been reasonably and to the procurement of satisfactory for aerospace

continued on next page

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Refined instrument displays reduce cockpit workloads and enable pilots to fly blind in fog

By I. F. E. Coombs

Workload is now a familiar word to both specialists and laymen and is used in most areas of industry and transport. Part of this load is the reading and the interpretation of instruments. It is measured in different ways depending on, for example, whether we are studying the work of the aeronautist, the operator of a factory machine or the pilot of an aircraft.

As aviation developed with each new generation of aircraft flying faster and higher, climbing and descending faster, more and more instruments were added. At first they were provided just to enable the pilot to know how fast, how high and which way he was going.

Later, a family of instruments and gyro instruments enabled him to fly blind to around 10,000 ft in fog. Another step was the addition of radio navigational instruments so that precise tracks could be flown towards the next airfield. As the jet engine revolutionized speed and rates of climb and as engine control became more complicated, the number of instruments multiplied.

What is the pilot's instrument reading workload in terms of, say, the motorist and the machine operator? The motorist rarely makes

use of instruments as a primary aid. Just as many of us look at a watch to find out how much time has elapsed or remains rather than to see the actual time, so the driver is often more concerned with how near he is to the speed limit.

The machine operator does not rely usually on instruments once the initial settings have been made, whereas the pilot, particularly in a large aircraft, is concerned with a number of varying parameters and with operating to precise values not only of speed but height, vertical speed, heading and engine performance.

Basically, there have been two ways of showing information to the pilot. First by the familiar pointer moving across a scale—the clock type instrument. Second, by giving the pilot a pictorial or position display—the attitude director from which the pilot can see instantly whether his aircraft wings are level with the horizon and whether the aircraft is flying level or climbing or diving.

For many years attempts to reduce cockpit workload by making drastic changes in the face of the dial type instruments, particularly the airspeed indicator and the altimeter, were limited because, if they were to be sensitive enough to give acceptable accuracies, their well as a conventional reading. The



One of the latest DME indicators with LED display elements.

only lightweight pointers over limited scale lengths. In the past 15 years instrument mechanisms have been refined and elaborated by incorporating electronics and micro-electronic sensors so that there are now many different ways of presenting clear, easily read and unambiguous information to the pilot.

No longer do the limitations of the mechanism dictate the type of display. For example, the counter-pointer instrument gives both a numeric reading as well as a conventional reading. The this type of integrated dis-

play can be close packed into an instrument case 8in square and about 7in in length.

If only a numeric reading is needed, then gas discharge tube elements, now familiar as displays for pocket computers, can be used to give a bright, easily read presentation using smaller instrument case sizes. Another example of a numeric display is the fuel-flow indicators of Concorde which use tungsten filament elements.

Even though the dial type instruments have been raised to a highly advanced level, there are practical limits. If a clear representation of "miles" information is needed or if a number of different values from different systems have to be displayed on one instrument, then recourse has to be made to the electronic display, such as the CRT.

Given the necessary computer and CRT, there are few limitations to the amount of data which can be displayed, either on the instrument panel or superimposed through an optical system on the pilot's forward line-of-sight.

This pilot's workload can be reduced by combinations of pointers and analogue displays, such as representations of the aircraft and of the radio beams leading to a navigational waypoint, as well as precise numeric groups. The electronics and servo mechanisms to give position and heading, the installations in aircraft.

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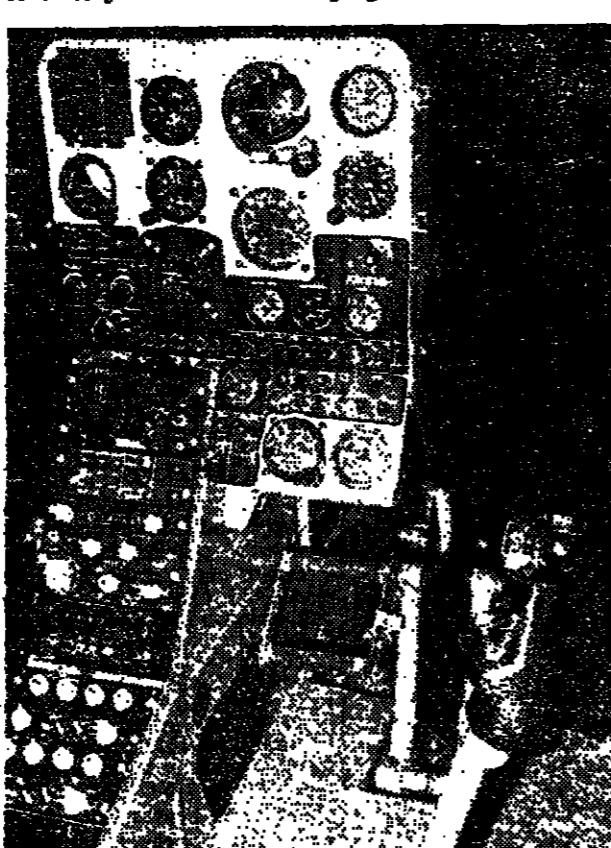
By Parry Rogers
director of personnel
Plessey Company

As Farnborough comes around again, boys of all ages renew their enthusiasm for the aircraft on display and for all the technical wizardry of the aerospace industry. As the younger boys demonstrate their aeronautical knowledge and are able to explain to their fathers the difference between NDB and VOR, some parents may be anxious because of the impracticalities of the spaceman and test pilot ambitions, and because they lack information about suitable careers to which their sons and daughters can be encouraged to aspire in industries which can be expected to prosper for many years.

One such industry is electronics, and this article offers to parents and students some information about careers in electronics and where to turn for more detailed information.

It is not possible to define the uses society will make of electronics in the future but it may suffice to say that electronics are the most pervasive technology in our history. The dependence of the space and Concorde programmes on electronics is well known and will be much in evidence at Farnborough, but many of the less visible electronic products are of comparable technical interest and of greater value in terms of business and employment.

The outstanding example is the computer employed in business, government, medicine, universities, traffic control, machine tool control and a host of other uses. Electronics are also the technology behind the radar, television, satellite communications, radio in the air, at sea, and in your car and home, and in your telephone system we take so much for granted.



The controls of the Westland Gazelle helicopter include, in the left-hand corner, the units for the Plessey PTR377 UHF/VHF communications transmitter 'T' receiver and the Plessey PTR446 IFF/SSR transponder.

These indicate the enormous untapped potential of the electronics business and show that this is a sector which meets the first criterion for your son or daughter as an industry with a future of undefinable growth.

So you yield to the pressures of your teenage son who demands to be taken to Farnborough and you begin to wonder whether his zest for aircraft, radio and electrical gadgets might be pointers to the kind of job he would find satisfying and rewarding. An interest in maths and physics would also be important indicators.

Perhaps the next thing to determine is the level of academic attainment of which he is capable.

The future even more than the present is the age of qualifications. It is true many employers are interested in qualifications only at the recruitment point, but there are many sad stories already of men who

have lost their jobs through no fault of their own in their forays only to find that no one will consider them for a comparable job because they lack the qualifications they should have obtained in their youth.

There are a variety of channels of entry into the electronics industry and individual advice is necessary to explore the right one for each boy or girl. Let us consider just two of them—

the technical apprenticeship and the academic route.

Whether your son is best suited to one of these paths or another is something for his form master, his careers master and his headmaster to advise you on. His form master and his headmaster should be competent judges of his academic

potential. Not all schoolmasters are reliable judges of a person's capacity for vocational oriented education and the graduate in electronics and the graduate in

electronic engineering.

The apprentice technician

will undergo a planned blend of practical training on the shop floor and in the technical offices of his firm and a technical education through Ordinary National Certificate, Higher National Certificate, to possibly one

or more degrees.

From this apprenticeship

and HNC attainment can

come membership of a chartered engineering institution which is the professional accolade and the way is

open to the top.

By comparison, the graduate has had three, or even

four years at a university

where his personality should have matured with a broader view of life, society and culture. After appropriate training and experience the graduate will attain the same professional qualifications as his HNC colleague and will be competing with him for technical and managerial positions.

Electronics is the branch of engineering most suited and most welcome to the qualified female. There is scope for them in research and development, in drawing offices and in engineering offices. For any daughter showing an interest in Farnborough and similar subjects, give her help and encouragement. We need more women engineers.

There are two primary career paths for the electronic engineer to follow.

The individual whose flair

is technical, whether research, design or in another specialization, needs to receive recognition and income growth to reflect his

contribution.

By this process he may become the managing director of a Plessey division in his thirties and able to take good care of you in your old age as you sit

watching world events on your electronic wall—including, perhaps, the air display of Farnborough 1984.

Novel radar scanner provides many data simultaneously

By P. E. G. Bates
divisional managing director, Plessey Radar

The radar division of Plessey is actively involved in a number of exciting new developments aimed at improving the facilities available to both civil and military users.

One which has recently attracted worldwide interest is the AR3D, a long-range, three-dimensional surveillance radar which, because of its revolutionary design, offers significant advantages over other conventional plan and three-dimensional radars.

The AR3D combines mechanical scanning in azimuth with the novel electronic technique of scanning in elevation by using a pencil-shaped beam which sweeps in the vertical plane at a high rate.

In this receiver system the return signals are amplified and separated into channels representing elevation bands of approximately 2°. The signals are time-compressed and their frequencies analyzed to give fine elevation measurement from which the target height is automatically calculated and is displayed alongside the appropriate target.

This radar provides accurate positional data and allows targets very close together, within 100ft, to be distinguished as separate targets more easily than with other radar systems.

The signal compression system also gives greatly improved performance in detecting aircraft against a background of unwanted reflections from rain or other interference, whether man-made or natural.

The AR15/2 provides greatly improved detection of aircraft, particularly at low level and short ranges, with a significant reduction of unwanted ground, weather and "angel" returns.

A further development, using the latest solid-state technology and mini-components, is the Plessey Series 200 automated secondary surveillance radar system. In addition to aircraft positions derived from primary radar, the system displays automatically on the radar screen bright data labels moving with each aircraft's radar blip, showing call-signs, altitudes, courses, speeds, destination and routes.

Integrated with the AR15/2 or other primary radar, the system forms an ideal, low-cost automated ATC system, within reach of users with limited budgets, suitable for airfield approach, terminal area control and long-range surveillance purposes.

Looking specifically at civil aviation, Plessey Radar has introduced a number of new developments. A new primary radar equipment for air traffic control terminals and approach surveillance is the dual beam AR15/2 S-band (10cm) medium-range radar, replacing the earlier AR1 and AR15 equipment.

A feature of this is the larger vertical aperture aerial system with a "transmit/receive" horn and "receive only" feed combination to provide two beams. Other features include: frequency diversity operation using mainly solid-state transmitters and receivers, rimable magnetrons, parametric amplifiers, and digital moving target indicator with automatic clutter gating and background subtraction.

A new high-precision printed circuit deflection coil has been developed for the Series Nine, which achieves fast deflection speed, and a new no-compromise contrast-enhancing screen designed to reduce reflections from the display without degrading resolution.

The Series Nine display is aimed primarily at the radar market, but will also serve any application where bright, high quality graphic data is required from a computer system.

For air defence, however, the most advanced radar in the world is not, in itself, sufficient. The emphasis has to be on a company's proved capability to devise, engineer, install and maintain a complete system.

As a result of its work for the United Kingdom Government and other export projects, most of which are classified, Plessey Radar has one of the largest programming teams in the world, with the skills and disciplines necessary for real-time computer-based air defence systems. This consists of system analysis, project definition, programming and hardware engineering.

In the development of air navigation and terminal landing aids, there are two significant techniques now being used by Plessey Navair. The first is called Series Nine. The display achieves a new standard of quality in the presentation of distortion-free characters and vectors; the latter, though achieving the accuracy of digital techniques, lacks the smudge often associated with this type of design.

Parallel with these developments, Plessey has introduced a new graphical display system, called Series Nine. The display achieves a new standard of quality in the presentation of distortion-free characters and vectors; the latter, though achieving the accuracy of digital techniques, lacks the smudge often associated with this type of design.

A new high-precision printed circuit deflection coil has been developed for the Series Nine, which achieves fast deflection speed, and a new no-compromise contrast-enhancing screen designed to reduce reflections from the display without degrading resolution.

Unfortunatly, conventional VOR beacons are

sensitive to features in the terrain surrounding their site, and finding a precise spot where this unwanted interference from ground reflections is low is not an easy task.

The new generation of beacons now being supplied by Plessey Navair incorporates the Doppler principle of transmission. Put simply, the Doppler effect is the change in frequency of a received signal when either the transmitter or the receiver is moving, one in relation to the other. The most homely example is the change in the sound of a train whistle as the locomotive advances towards you and then recedes from a stationary listener.

Plessey DVOR (Doppler VOR) beacons are immune from most of the disadvantages of ground-based systems. This consists of system analysis, project definition, programming and hardware engineering.

As part of the United Kingdom Civil Aviation Authority's major air traffic system programme of re-equipment, Plessey DVOR beacons are scheduled for installation at sites throughout the United Kingdom. These forward-looking programmes will ensure that Britain will be one of the first countries to have 100 per cent DVOR beacon coverage in its airways systems.

The second major advance in techniques is that Britain remains in the forefront of the air navigation and landing aid field, where it will continue to make a major contribution worldwide to the safe and efficient use of the available air space.

The second major advance in techniques is that Britain remains in the forefront of the air navigation and landing aid field, where it will continue to make a major contribution worldwide to the safe and efficient use of the available air space.

MARCONI ELLIOTT AVIONICS

Marconi-Elliott Avionic Systems Limited
Head Office: Airport Works, Rochester, Kent
Telephone Medway (0634) 444400 Telex 36332

and at Basildon and Borehamwood

GEC-Marconi Electronics

Fighting the battles by computer saves men, money and machines

by J. D. Conry

Simulation is the technology of make-believe and, as in all games of pretence, has the key advantages that the players need not really get hurt and the game is cheaper than the real thing. Since it is now fashionable to measure injury and death in financial terms these can be considered as complementary.

It is hardly surprising, therefore, that as aircraft have become more advanced and consequently more costly, the emphasis on flying in simulators has increased. Naturally the simulators have become more complicated, not just merely in the aircraft system but increasing their realism and therefore their effectiveness as replacements for the aircraft.

Thus we have seen the progressive development from the original Link Trainer, used during the Second World War, which was to all intents and purposes a procedure trainer, right through to the logical successor the Apollo Spacecraft Simulation System.

The key advances in realism were made in the 1960s as demonstrated by the total change in training schedules during the decade: when, for example, the conversion training for a pilot transferring from one aircraft to another changed from being totally in the aircraft at the beginning of the decade to being only about 10 per cent in the aircraft at the end.

The fundamentals of economics are the driving force for this. For, just for the Nimrod, with this training the RAF has the first time has a total crew trainer being able to operate a full range of operation equipment in the coordinated, controlled and fully flexible tactical exercise setting required for both conversion and squadron training.

The Nimrod Mission Simulator has two parts: first a Nimrod Flight Simulator on a three degree of freedom motion platform with a Visual Flight Attachment capable of showing both land and seascapes. This simulator provides the standard conversion, safety and continuation training for both pilots and engineers.

The second part is the Maritime Crew Trainer (MCT) which is, in effect, that portion of the Nimrod fuselage occupied by the navigation, sensor and communication team. The flight simulator and maritime crew trainer can be joined electronically to allow a full crew exercise or, if the flight simulator is required for purely pilot and engineering training, each part can be used separately. In these circumstances the MCT receives its "flight deck" input by way of a secondary non-standard pilot position.

The MCT fuselage houses the full range of ASW navigation, sensor, weapons control and communications equipment used by the crew to locate, track and attack targets. All systems

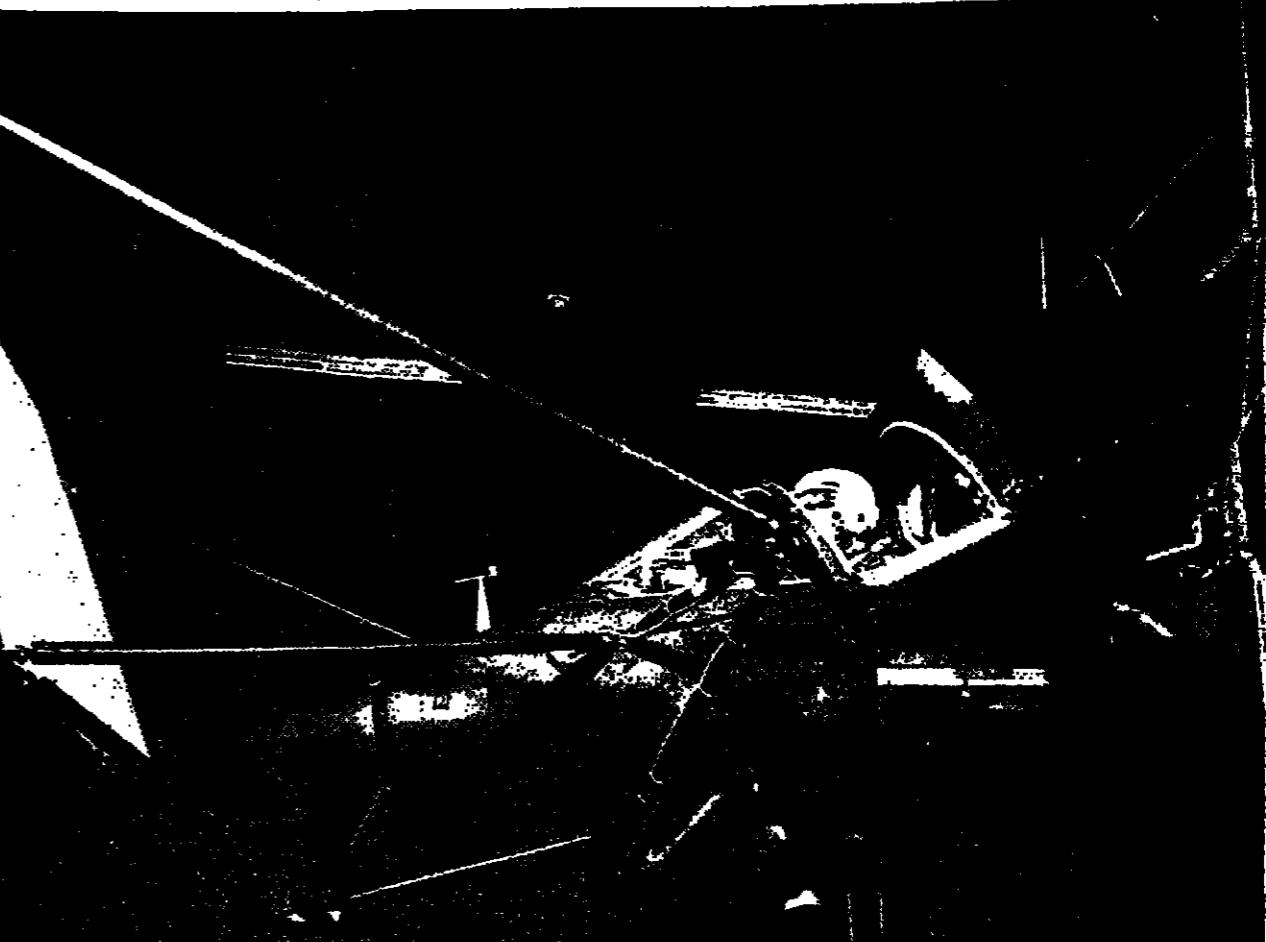
have realistic inputs/outputs and other conditions which are coordinated to required by the tactical setting.

The training value achieved by squadrons and training units using the Nimrod Full Mission Simulator has reached more of the goals set and will add enormously to the operational efficiency of the RAF ASW crews. In addition, the financial savings from reduced aircraft flight times alone mean the present simulator has paid for itself after about 18 months.

What of the future? There can be little doubt that Full Mission Simulators will develop further in line with later technologies. This will bring improvements in realism by the application of digital storage techniques to visual systems and radar land mass simulation.

As with all modern computer-based systems, the trend to increase flexibility through modularity is already apparent, so we can expect to see the mini-simulator with growth potential and also the adaptable simulator. This same technological trend to compact modular systems leads to the possibility of increased mobility through trailerization.

The MCT provides detailed and realistic training to meet the stringent requirements of both ASW and maritime crew squadron training without the need to assemble the submarine, surface vessels and aircraft which would be necessary in a live exercise setting. All these can be programmed into the computer system which coordinates and records each exercise in accordance with the weather user.



This Harrier cockpit is reproduced faithfully so that the transfer of training from simulator to aircraft is smooth and fast. The visual scene is projected on the nose-mounted screen by the three-barrel colour projectors to the rear.

Britain keeps its head up

by Mark Lambert

Neither civil nor military aircrews can perform their missions without constantly scanning instruments. Height, speed, course, and even climb or descent are not immediately apparent by looking out through windscreen and windows. Yet they must be known accurately at certain times, and there are many other factors to be taken into account.

Already it is possible to carry out training for full tactical missions more effectively using simulators rather than aircraft, at a fraction of the cost and risk. Future developments in simulator design can enhance their value to the user.

It is possible to give the pilot all the instrument information he needs in this form so that he need not look down at his instrument panel. He can fly with his eyes constantly on the outside world, but see all the necessary instruments at the same time.

This device, revolutionary in its time, has recently been developed much further. It was found a few years ago that a miniature digital computer could better "write" and move the instrument symbols in the head-up display. Once the computer was there, it could be extended to calculate, then display aiming instructions as well as the basic instrumentation. So the head-up display (HUD) became the HUD weapon aiming system.

The extended miniature computer could either give the pilot a bombing sight in the form of a single bright line to manoeuvre easily on to the target, or it could draw a tracer line depicting accurately the path of the fired bullet to the pursued aircraft. With electronic and computing refinements, both these techniques have produced devastatingly accurate aiming systems and have been proved in many combats.

Next came the combination of scanned television picture with the individually drawn symbols of the cathode-ray technique. An infra-red "eye" carried in the nose of the aircraft produces in total darkness a television-like picture of the terrain ahead and this can, by electronic video combining, be superimposed in the head-up display.

This concept has been in circulation since the early 1960s and its most spectacular manifestation has been the head-up display, invented in Britain as a further development of the traditional mechanical gyro gunsight and still a product of skilled knowledge almost exclusive to Britain. Nearly all head-up displays in America, Sweden and Germany are British made.

What the head-up display does is to form the symbiotic information, in a series of lines, scales, symbols

and figures, on the face Recognition Attack Multi-tube. This image shines through lenses on to a semi-reflecting glass plate mounted in the pilot's line of sight through the windscreen. The symbols are clearly visible as a dismembered, bright moving pattern superimposed on the outside world.

It is possible to give the pilot all the instrument information he needs in this form so that he need not look down at his instrument panel. He can fly with his eyes constantly on the outside world, but see all the necessary instruments at the same time.

Light and dark shaded areas, lines, symbols and figures, all in a television type of picture, can form a symbolic equivalent of a complete flight instrument panel. Or the cathode-ray tube writing technique can "write" a panel of figures and words on the same screen. This could provide information of an administrative kind about the fuel, hydraulic, electrical and other systems in the aircraft.

Next followed the use of the cathode-ray tube screen in the cockpit as the method of communication with the central computer, which more and more military aircraft are carrying. The computer displays information on the tube-face. With a keyboard beside the tube, the operator sorts the information, adds or deletes data from the computer's memory, builds up a picture of the operation and decides what to do next.

This is where the technology stands. Head-up display and its head-down equivalent are an accepted part of any new military aircraft. Europe's Multi-role Combat Aircraft (MRCA) gives the pilot a head-up display for all his normal flying and for aiming his weapons. His navigator has not one but three electronic screens and two keyboards for viewing and editing information generated by radar and navigation systems.

Both head-up and head-down displays communicate directly with MRCA's central digital computer, the nerve-centre of every attack mission and the central sorting house for all operational information on board.

The concept is really not so strange. Equivalent systems for using computers in industry and transport services are accepted as routine equipment on the ground. It is natural that the air should follow. Perhaps the technological conclusion is that, for once, electronics is leading aviation. Avionics are having to run to catch up with the fast-moving computer world.

Pilots have made dive-bombing attacks in pitch darkness using this night vision system fitted in United States Navy A-7 Corsair fighters. The American Navy has called it Target

PHILIPS

September 2-8, at Farnborough International '74

Head-up displays like this Elliott system for American attack aircraft allow the pilot to see all necessary instrument and guidance information in instinctively understood symbols without taking his eyes off the outside world.

AVIATION

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Philips have put together an 'electronic package' to give certainty in flight and greater safety for men who fly.

The package embraces complete airport lighting systems; airport recorders; telecommunications equipment; ILS and DME; radio altimeters; ATC systems; MADGE landing systems; VHF/DF communications recorders; radar systems (air and ground based); air data computers and traffic control radar.

Concerned in the development of these systems and equipments is an international consortium of 9 Philips organisations:

Elektro-Spezial Germany.

Hollandse Signaalapparaten Netherlands

The MEL Equipment Company UK

Philips Electronic Industries Canada

Philips Telecommunicatie Industrie Netherlands

Philips Teleindustri AB Sweden

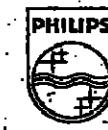
Philips Gloeilampenfabrieken Netherlands (electro, acoustics and lighting divisions)

Télécommunications Radioélectriques et Téléphoniques (TRT) France

Their resources are interrelated and readily available so that they can be focused on a specific project or directed towards a broad-based objective.

Jump jets, dancing helicopters and fast fly-pasts have all come about through superb technology.

PHILIPS IN AVIATION as in many other fields, make a significant contribution to the future of man in the air.



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جامعة العلوم

More than a third of the UK avionics output is exported

by Kenneth Owen

Technology Correspondent

Britain's aviation electronics industry reflects the demand for increasing automation on board aircraft in three main ways. First, avionics has risen in importance to represent in many cases almost an equal one-third share with the airframe and engine in terms of value.

Secondly, avionics equipment is specified from the outset of an aircraft's design and, indeed, has come to influence the design of the airframe itself.

Thirdly, it has become an exporting business in its own right. This is an important factor affecting the United Kingdom industry's participation in overseas aircraft programmes.

In the United States in particular, British avionics equipment is being supplied directly for long-production and advanced technology aircraft programmes. In Europe, participation has mainly been through collaborative international projects, which have brought more than a fair share of headaches for the British avionics industry.

Still a fragmented industry

In most of the collaborative projects the industry believes that British avionics has suffered in the work-sharing arrangements because of the greater importance attached to the airframe and engine elements.

The danger of purchase of avionic equipment by the Ministry of Defence (Procurement Executive) by expediency from the shelves if overseas competition is the biggest threat to the avionics industry. The Electronic Engineering Association said earlier this year.

The association urged the creation of a vigorous avionic policy-making body to ensure, particularly in inter-governmental sponsored collaborative projects, that United Kingdom industry maintain its technological lead and be used to satisfy the requirements for defence equipment.

The British industry's output of electronic equipment for aviation systems

amounted to about £156m of Defence (Procurement Executive), the Civil Aviation Authority and the Department of Trade and Industry (now the Department of Industry) in 1973, according to the Civil Aviation Authority. Of this total, about £60m was for airborne equipment (radar, electronic navigational aids, radio communications equipment, telemetry and guidance systems); £40m for ground equipment (flight simulators, trainers and teaching aids, radar, and fixed and mobile radio communications).

This will lead to a substantial increase in the International Civil Aviation Organization's standard characteristics of the future landing guidance system for worldwide adoption.

The selected system is expected to enter service in the early 1980s. Over the first 15 years of its operational life, the world market for both ground and airborne equipment could amount to some £1000m.

Systems already being evaluated at the Government's Royal Aircraft Establishment, Farnborough

Plessey is also associated with the Hazeline Corporation, one of four American companies working on the Federal Aviation Administration's own MLS programme, and on longer-term marketing plans for the system.

Missile guidance systems

Research and development contracts placed by the Ministry of Defence with British industry have included airborne interception and airborne early-warning radar developments, advanced tactical communication and bombing systems, television surveillance and missile guidance systems, advanced flight control systems developments, including "fly by wire" and "fly by light" (optical data transmission), advanced sonics processing and display systems for anti-submarine defence, and advanced processors and cockpit displays.

A trend in the industry which has spread from the United States to Britain is the setting-up of "package" type businesses, divisions or companies to provide complete electronic and electrical facilities for airports. These facilities, such as navigational aids, lighting, primary electrical power communications, closed-circuit television and information networks, are supplied on an all-in "turnkey" basis.

America's dominance has international advantages

by Pearce Wright

A recent analysis of possible shortages of raw materials and likely trends in inflation in the United States aerospace industry showed some sharp differences of opinion between management planners working for big companies and government economists in Washington.

The commercial economists were particularly gloomy about prospects in those sectors of the industry that depend on the more unusual materials and manufacturing processes many of which are essential for producing advanced electronic systems. Such systems are needed for avionics equipment, computers, radar units, earth stations and intricate devices that go into black boxes.

This vast array of apparatus is necessary for guidance and navigation, satellite communications, laser range finders and host of other purposes with potential customers throughout the world. The only restriction American manufacturers face occurs when their products fit into a missile or an aircraft or satellite of strategic importance. Otherwise the army of scientists, engineers and technicians employed by the avionics firms turn out an almost endless stream of gadgetry.

Firms from other countries clearly find this avalanche of technology underwritten largely by defence requirements discouraging to compete against, but they benefit to some extent if the American avionics sector remains commercially healthy.

The stimulus behind the United States industry stems from a combination of weapons development, civil aviation projects, and space research and development. Indeed avionics equipment accounts for at least 30 to 40 per cent of the value of a missile, spacecraft or aircraft. In some of the scientific satellites this proportion is higher.

The broad range of work done by the Americans provides a fillip internationally by widening the number of uses to which new technologies can be applied in space and aviation. It would be unlikely that the Americans

could hold the lead in all these fields unless they acquired a monopoly of the world's science and engineering intellect to match their enormous government investment in technology.

Nevertheless so far there are more areas in which the United States industry is technically ahead of its competitors than not. Hence there is a direct advantage to European companies in establishing technical links with United States firms for products that otherwise take many years to develop.

Licensing arrangements with overseas firms are not made lightly or too willingly, but special circumstances agreements between Nato countries for instance often provide the incentive for cooperation.

At present the American avionics industry seems to be demonstrating the truth of the dictum that a healthy home base provides the platform for generating a profitable export one. Relations notwithstanding, the Nixon Administration's relations with the Middle East and Soviet countries opened useful markets for the avionics producers.

A more encouraging development from the viewpoint of the European industry is a special scheme run by the United States Air Force to promote technical collaboration through a European office of aerospace research and development. The idea, known as a "window on science" project, aims at attracting proposals for developments from European teams that might have a particular application to American needs or be ideal for joint development when married with complementary work in the United States.

These programmes extend from an interest in long-term fundamental investigations using wind tunnels or simulators to more immediate practical issues such as designing instruments to check whether certain types of instrument panel accelerate pilot fatigue.

However, these are essentially topics covering common problems of aircraft and other vehicle design, operation and maintenance. Fundamental workers in a first-class research institution in the United Kingdom, a university in Germany or industry laboratory in France have equal chances of discovering the best answers to such questions.

Somehow the liberal attitude shown to what might be considered subjects of intellectual freedom disappears over matters of commercial technology.

Marconi Radar

Air Defence

Air Traffic Control

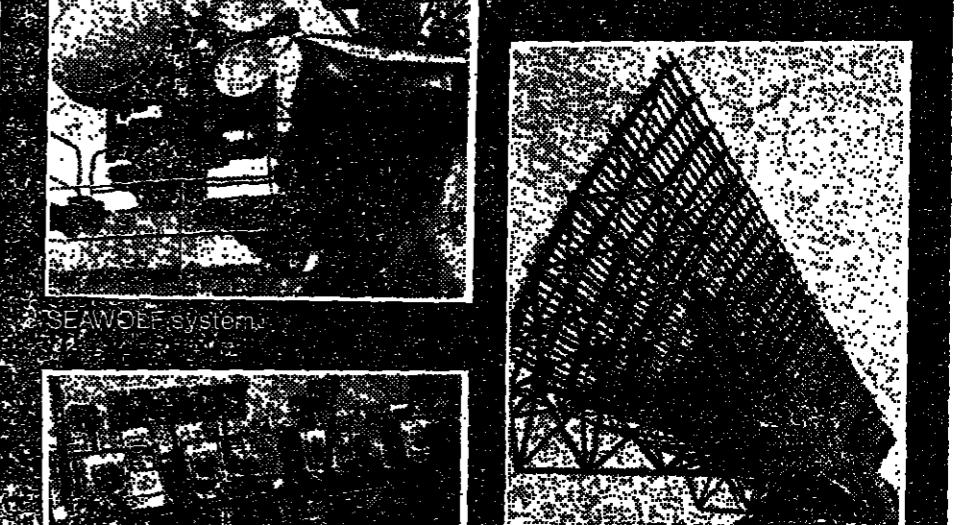
Naval Radar - Simulation

Control Engineering and

Instrumentation



Mobile, transportable defence radar



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Control techniques developed for Concorde will play vital role in future safety

by Group Captain E. G. Palmer
Flight Controls Division
Marconi-Elliott Systems

After more than a decade of design, development and debate, we are now entering the era of supersonic passenger operations. Concorde has demonstrated startlingly low journey times on actual airline routes and has already "lapped" the Boeing 747, completing a double transatlantic crossing in under the time normally taken for a single journey.

This quantum jump in speed will tend to shrink airlines' long-haul timetables to the point where service frequencies approach those of the subsonic jets. The avionics developed for Concorde will play a vital role in enabling these operations to take place safely.

Primary requirements for supersonic transports are accurate flight profile control to permit maximum payloads to be carried at minimum fuel cost, achieving good handling qualities over a wide range of speeds and altitudes and making pilot workloads compatible with the present long-haul jets operating at only two-

fifths the speed. This has placed special requirements on avionic systems for flight control and engine management as well as calling for the full range of avionic navigation, communications and instrumentation systems with which airliners are normally equipped. Like other long-range jets, supersonic transports carry inertial navigation systems as a self-contained means for making accurate passage across oceans and uninhabited ter-

rain. For both Concorde and the Russian Tupolev 144, great emphasis has been placed on the design and integration of their avionic flight control systems. Many of the techniques called for, which seemed so advanced 10 years ago, have gradually gained acceptance on more recent subsonic airliners, and other aircraft, a fact which gives credit to the judgment of the SST designers at the time.

To take the flight control systems as an example, use of electrical signalling ensures a very accurate relationship between movements of the flaps and rudders and cockpit design. As a result of these developments, airline pilots have

craft. All supersonic aircraft exhibit a wide range of control sensitivity throughout their speed range and electrical signalling provides very precise control at all speeds. Most airliners now use avionic systems for augmenting stability and supersonic transports are no exception. The SST uses automatic stabilisation in pitch, roll and yaw and automatic throttle controls are also available as full-time aids to piloting.

Concorde's automatic flight control system provides 33 functions, twice the number for subsonic jets, and push-button controls ensure ease of selection by the pilot. The flight profile, especially during supersonic cruise, is selected by a single "max operating" mode button.

On taking off, he engages autopilot, selects the appropriate modes which control the aircraft's climb out and engages INS mode for azimuth steering, once air traffic control conditions in the runway threshold is permitted. His hands and those of his co-pilot will be free to make landing take place automatically, to operate the radio communication and the navigation systems and to handle check lists. Subsonic warning and landing display

reported favourably on Concorde's handling in conditions identical to those sought for transition to which automatically identifies supersonic flight. When this is obtained, "max operating" mode is selected and control. Although they com-

selected the automatic stabilisation, automatic trim, automatic throttle and powerplant intake and nozzle control systems before take-off, the pilot can ignore them until arrival at his final destination. Before take-off, he aligns his navigation system and inserts, through a keyboard, the coordinates of "waypoints" through which the aircraft will pass during the journey instead. He will be able to couple the navigation system to the autopilot later, by pressing the INS button on the autopilot control panel.

The aircraft remains in "max operating" mode throughout, being steered in azimuth between selected waypoints and displays, systems which the pilot, especially during supersonic cruise, is selected by a single "max operating" mode button. On taking off, he engages autopilot, selects the appropriate modes which control the aircraft's climb out and engages INS mode for azimuth steering, once air traffic control conditions in the runway threshold is permitted. His hands and those of his co-pilot will be free to make landing take place automatically, to operate the radio communication and the navigation systems and to handle check lists. Subsonic warning and landing display

reached as quickly as possible and clarity is dual installations, each of which will apply when it enters service in 1976.

On a typical flight, having selected the automatic stabilisation, automatic trim, automatic throttle and powerplant intake and nozzle control systems before take-off, the pilot can ignore them until arrival at his final destination. Before take-off, he aligns his navigation system and inserts, through a keyboard, the coordinates of "waypoints" through which the aircraft will pass during the journey instead. He will be able to couple the navigation system to the autopilot later, by pressing the INS button on the autopilot control panel.



Concorde's flight deck with push-button controller, part of its advanced avionic flight control system.

Pioneer automatic landing system

by R. H. Ashforth
Smiths Industries

The automatic pilot in the Trident is the major part of the Smiths Industries flight control system installed in one of Britain's most successful passenger aircraft. The Trident not only had the first automatic landing system of its kind but many of its features have since been adopted for the flight control systems of later types of aircraft. Both the TriStar and the A300 Airbus incorporate the fail-safe concept which Smiths Industries pioneered in the early 1960s.

The company, in association with Hawker Siddeley (then BEA), revolutionized the control concept for automatic landing systems and this was recognized by the granting, for the first time, of a Queen's Award for the design and development of an automatic landing system. From its inception, the Trident system included provision for the automatic acquisition of a selected height, a descent lock and a mach lock as well as the first application to a civil aircraft fleet of automatic engine throttle features which are now taken for granted.

Since the original design equipment has been developed to include a facility for automatically carrying out automatic landings on an experimental basis with a specialized experimental crew, but an entirely different exercise to perform automatic landings with fare-paying passengers in an aircraft crewed by regular airline pilots. Before a passenger-carrying aircraft can land in thick fog the certifi-

cation authorities require proof that the operation is safe.

The significant milestones in the Trident low-weather autoland programme have been as follows:

In April 1964 the Trident entered BEA service and automatic approaches to a height of 200ft above ground level with a forward visibility not less than 800 metres were allowed. The next year's certification was granted for autoland in 100 metres forward visibility.

Clearance for landing in 100 metres forward visibility is confidently expected this winter. However, it is likely that this will be the end of the programme.

The autopilot fitted to the Trident was for many years the most comprehensive of its type and is only now being matched by other autopilot manufacturers in later aircraft. It made significant inroads into reducing pilot workload and thus increasing air safety.

In January 1968 the auto-

land weather minima were reduced to 100ft pilot decision height with forward visibility not less than 400 metres: this is known as category 2. After another three years of step-by-step proving, clearance was granted for automatic landings with a pilot decision height of 125ft and a visibility of 270 metres.

In the winter of 1973-74 the certification clearance for landings was lowered to a visibility of 200 metres and category 3A.

The present work programme is aimed at reducing the clearance to allow landings in category 3B con-

Manchester fleet's new equipment shines in fog

by Malcolm Moulton

The three-year gap in the programme, 1968-71, arose because the certification authorities would not allow automatic landings below the category 2, 100ft "decision height" point until the ground-based instrument landing system (ILS) had the required integrity.

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In fact the head-free para-

visual director (PVD) ground roll guidance system and ground speed and distance-to-go system developed for the Trident and manufactured by Smiths Industries has both been specified by British Airways for their L1011 TriStar aircraft.

Also the automatic flight control system of the A300 European Airbus has been developed and made with Smiths Industries as the United Kingdom partner company.

aided by all-weather reliability, has enabled British Airways to increase profitability and capture as much as 40 per cent of the West German internal market this year, a record performance.

Marconi-Elliott Avionic Systems supplies the whole range of avionic systems which forms the heart of an airliner's all-weather landing system—as well as ground-based equipment for monitoring landing performance.

The on-board avionic systems consist of two main elements—guidance and control. The company supplies one or other of these elements for every British aircraft capable of all-weather landing.

The 1-11 system was developed by the company's flight controls division, working in conjunction with the British Aircraft Corporation and the engineering, operations and maintenance staff of British Airways. Success is due to accurate performance, reliability and extremely simple design. A single-channel monitored system, it automatically detects any failure during an approach, always enabling the pilot to take over control safely. Although this would not permit landing in completely blind conditions, it gives a very high level of all-weather regularity and safety, at a fraction of the cost of "blind operations".

Maintenance engineers responsible for the Super 1-11, VC 10 and Concorde, report a high level of

serviceability with the system. They are backed by the support scheme, provided by the supplier's aviation service and repair division.

The 1-11's automatic landing system, which enables long-distance stages to be flown at frequencies characteristic of a short-haul airliner, makes the role of the automatic flight control system as important as that on the 1-11. Advanced operating modes are provided in keeping with the wide range of speeds and conditions encountered and airline pilots have praised the aircraft and its systems during evaluations under routine service conditions.

Supporting every aircraft's automatic landing operations are numerous ground-based electronic systems, including air traffic control, radar and transmitters to measure visual range in fog. Marconi-Elliott Avionic Systems' special projects division has also produced a unique system which monitors the performance of every aircraft which lands on the instrumented runway at London Airport. Known as ALMS (aircraft landing measurement system), it has been installed by the Civil Aviation Authority to provide data which ensure the maintenance of safety associated with all-weather landing.

OPLESSEY

Worldwide, aerospace is an important market for Plessey

From engine starting and fuel management systems which get (and keep) today's civil and military aircraft in the air, to the instrument landing systems which bring them safely down, even in the poorest weather, Plessey is there. Plessey air navigation beacons keep them on course. And it is Plessey radar which helps the air traffic controllers guide them through today's congested air lanes to land safely at airports where the whole electronics, communications and lighting 'package' has been implemented by Plessey as a single contract.

Plessey actuators translate the pilots' commands into action and Plessey communications equipment helps maintain voice contact between ground stations and aircraft in flight. Routine servicing frequently involves both Plessey technicians and spares.

In defence aviation too, Plessey provides all these services and, in addition, supplies purpose designed radar, sonar and weapons control systems plus highly specialised hydraulic and other electro-mechanical components.

Worldwide, Plessey plays an important role in aerospace

The Plessey Company Limited, Ilford





Forthcoming marriages

Mr G. J. Atkinson and Miss J. E. Harrison
The engagement is announced between Geoffrey James, elder son of Mrs M. H. Atkinson, of St Andrews, Guernsey, and the late Mrs S. F. Atkinson, of Tormead, London, and Jane Elizabeth, daughter of Mr and Mrs K. J. Harrison, of Berkhamsted, Hertfordshire.

Mr M. Blake Watkins and Miss T. M. Foster
The engagement is announced between Michael, son of Mr and Mrs H. J. Watkins, 6 The Green, Woodford Green, Essex, and Tessa, daughter of Mr and Mrs S. E. Fryer, 24 Carlton Road, Ealing, W5.

Mr E. S. Dunnett and Miss J. C. Perry
The engagement is announced between Edward, only son of Mr and Mrs J. S. Dunnett, of Guine, East Sussex, and Jane, daughter of Mr and Mrs Frederick L. Perry, of Camlachie, Ontario, Canada.

Mr W. E. Gelson and Mrs J. A. Dear
The marriage has been arranged and will shortly take place between Mr W. E. Gelson and the late Mrs C. M. Gelson, and Jennifer Anne, daughter of Mr and Mrs C. J. Walker.

Mr I. S. Lockhart and Miss R. Cartwright
The engagement is announced between Ian, only son of Prebendary Douglas and Mrs Lockhart of Bifley Rectory, Ludlow, Shropshire, and Rosanna, elder daughter of Captain Hugh Cartwright, RN, and Mrs Cartwright, of Ladye Place, Hurley, Berkshire.

Mr R. M. Orr and Mrs M. R. Blos
The engagement is announced between Robin Orr, of 9 Valley Road, Bromley, youngest son of the late Ian Orr, and Mrs Dorothy, daughter of Captain and Mrs E. J. Beaumont, of Chester.

Dr M. H. Seifert and Dr J. E. Morris
The marriage has been arranged and will shortly take place between Martin Howard, son of Dr and Mrs M. V. Howard, of Broadwalk, Winchcombe, Gloucestershire, and Jacqueline, daughter of Professor and Mrs Norman Morris, of 16 Provost Road, NW3.

Mr P. J. Stockley and Miss F. E. Jones
The engagement is announced between Philip James, son of Mr and Mrs J. Stockley, of Fairmile, Cheshire, and Frances, daughter of Elizabeth, daughter of Mr and Mrs W. J. Jones, of Ashleigh, Iver, Buckinghamshire.

Mr E. S. Tudor-Evans and Miss D. S. Boyce
The engagement is announced between Edward Simon, son of the late Mr A. G. Tudor-Evans, and Mrs Tudor-Evans, of The Grand, Newgate, Rose, Copleston and Diana Shirley, daughter of Mr John Boyce and the late Mrs Boyce, of Wellesey Orchard, Broadstairs.

Mr R. J. Woodward and Miss C. R. Denning
The engagement is announced between Robert, younger son of Mr and Mrs F. E. Woodward, of Sudbrook Gardens, Ham Common, Surrey, and Catherine Rosemary, younger daughter of Major and Mrs R. H. Denning, of Aller Barton, Cullompton, Devon.

The marriage took place between Mr John Nigel Newby and Miss Georgina Baillie Hill will not take place.

Coachmakers' Company
The Election Court of the Coachmakers' and Coach Harness Makers' Company was held at Fetterers' Hall last night when Sir Theo Constantine was elected Master, Mr W. W. Ward Senior Warden, Mr M. A. Smith Junior Warden, and Mr J. E. Rylands.

Birthdays today
Dame Elsie Abbott, 67; Sir John Erclebank, 59; Sir Macfarlane Burnet, 75; Lord Craigen, 70; Lord Ebbisham, 62; Air Marshal Sir Gerald Gibbs, 78; Lord Harris, 85; Major-General Sir Leslie Nicholls, 79; Sir Ronald Praim, 67; Admiral Sir Alan Scott-Moncrieff, 74.

£75,000 Premium Bond prizewinner
The £75,000 premium bond winning number is 8 YL 72924. The winner lives in Essex. The £25,000 number is 8 YL 571876. The winner lives in Shetland.

The £5,000 winners are: Captain William Harold Colman, VC, DCM and bar, MM and bar, of Burton-upon-Trent, who won his VC in 1943 as a stretcher-bearer private in the Royal Engineers in October 1943, left £7,842 net.

Mrs Florence Winifred Burrows, of Nottingham, left £95,228 net (duy paid, £8,675). Apart from £100, she left her estate to endow a bed or beds or a ward or wards in Nottingham General Hospital. Mr and Mrs John Morris, of 100 of Newark on Trent, left £52,272 net (no duy shown). After personal bequests of about £8,000 he left the residue between seven charities.

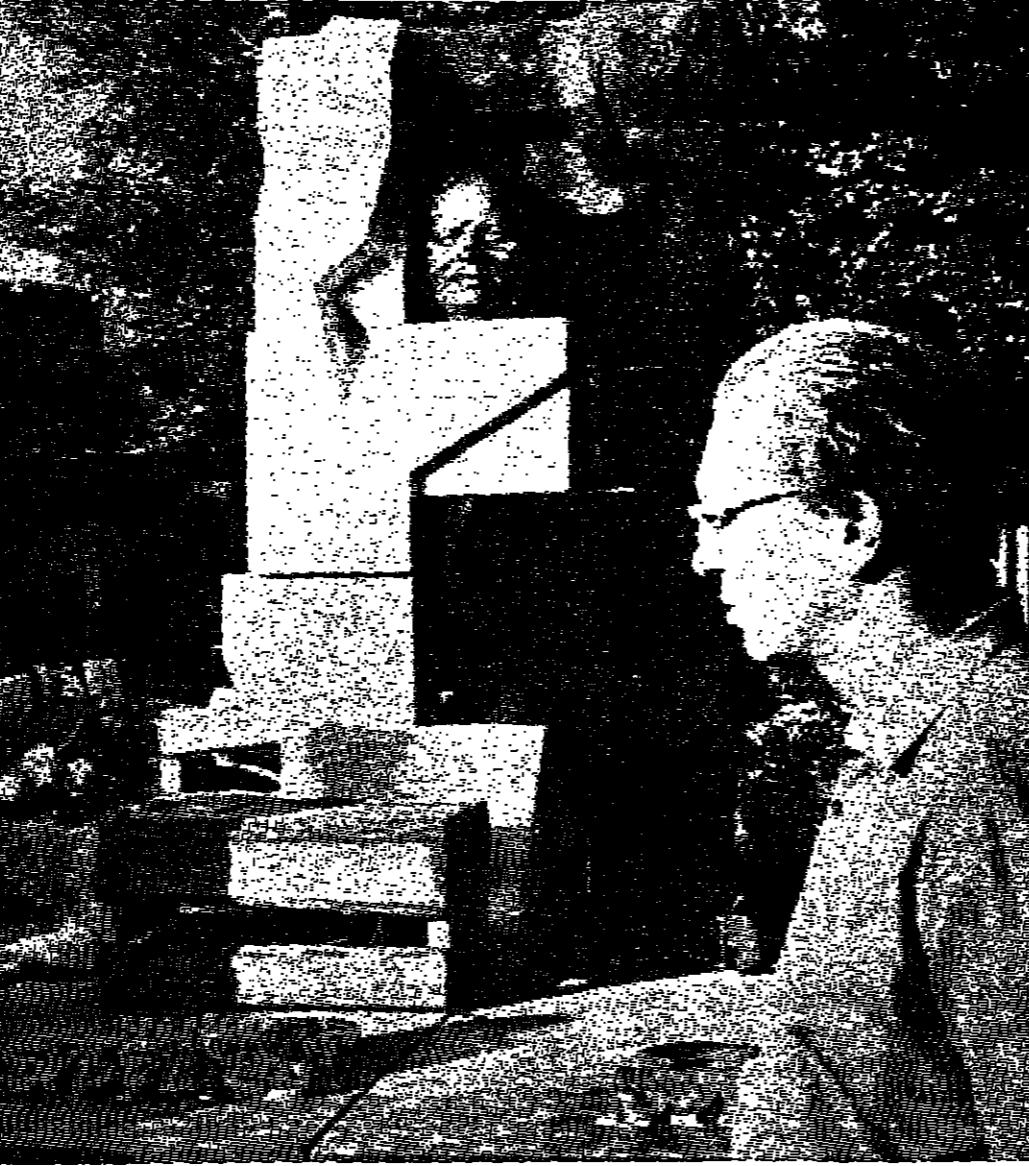
Other estates include (net before duty paid): further duty may be payable on some estates.

Reynolds, Mr Cyril John, of Clacton-on-Sea (duy paid, £5,251); £143,691.

Scott, Mr Andrew Meldrum, of Eastbourne (duy paid, £52,039); £157,352.

Lee, Mr Albert Percy, of Poynings, Sussex (duy paid, £7,766); £127,002.

Gresley, Sir Nigel, of Basingstoke, twelfth baronet (no duty shown); £9,045.



The memorial to Mr Nikita Khrushchev in the Moscow cemetery where the former leader's son, Sergei, stands after helping to erect it yesterday.

Marriages

Mr H. C. Roney and Miss A. P. Clowdesley Seddon
The marriage took place at Chelsea Old Church on Friday, Aug 30, between Mr Henry Charles Roney, son of Mr and Mrs Henry Charles Roney, of Kensington, and Miss Alexandra Philippa Clowdesley Seddon, daughter of Mr and Mrs B. A. Clowdesley Seddon, of Barn Hill, Stamford, Lincolnshire. The Rev C. E. Leighton Thomson officiated.

The bride, who wore a white and silver gown, with a lace veil held in place by a diamond and ruby ring, was attended by Revd. Christopher Roney, and Clare Philip and Henry Ross, and Clare Hodge. Mr Lovat Bonnet was best man.

A reception was held at Hurstong.

Mr G. Williamson and Miss H. J. Curbery
The marriage took place on August 31 at the Church of the Immaculate Conception, Farm Street, W1, of Mr Ian Gordon Williamson, only son of the late Mr Edgar Williamson and of Mrs Williamson of Hove, and Miss Lydia Josephine Curbery, daughter of the late Mr A. H. P. Curbery and Mrs Curbery, of Dublin. Father J. Tracey, SJ, officiated.

The bride, who was given in marriage by her brother, Mr John Curbery, was attended by her parents, and children could buy puzzles, models and cut-outs.

There should be guides to study collections, guides for children, and more printed matter about the historical background to exhibits.

Labels were often badly placed and illegible, and vocabulary books should be printed to explain archaic words. Museums assumed that people knew too much, Dr Strong suggested.

Museums should be places where people could feel at home, he added, and there should be places to eat sandwiches, plenty of "you are here" maps, and enough cloakrooms. Museums should be developed into situations where parents and children could buy puzzles, models and cut-outs.

That calculation is based on a

Museum officers urged to get rid of trash

By Gavin Scott
of The Times Educational Supplement

Museums are too much like "high-class trash cans", full of uninteresting odds and ends, and difficult to dispose of, according to Dr Roy Strong, the new Director of the Victoria and Albert Museum. In one of his first speeches since becoming director, he told a conference of museum education officers yesterday that he was concerned at the lack of good displays.

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Beef report predicts glut then shortage next year

By Our Agricultural Correspondent
of The Times Educational Supplement

A beef market glutted in the early spring of next year by under-financed animals, followed by a shortage of all red meat towards the end of 1975, is the sombre forecast for consumers in a study published by the Aberdeen School of Agriculture.

Beef cattle prices in the international market which have not been sufficiently recognized—the probability of increased demand from the Soviet Union, and Australian and Argentine sheepmeat by the oil states.

The *Outlook for Beef in the United Kingdom, 1974 and 1975* (Ed. G. R. Allen, School of Agriculture, Aberdeen, El.)

Brussels thanks the Welsh Guards

From Roger Berthoud
Brussels, Sept 2

Thirty years ago today the Welsh Guards, an armoured Division, crossed from France into Belgium. The Liberation of Brussels followed on September 3, 1944, after what was described by the War Office as "an armoured dash unequalled for speed in this or any other war".

Today Brussels' newspapers carried photographs and moving reminiscences of that deliciously happy day when the British freed the city from the horrors and humiliation of the four-year-long German occupation. Among many events up and down the country to mark the liberation has been a visit by the War Office to the Welsh Guards.

Afraid visitors to cemeteries

where their lost comrades were buried, they took part this evening at the presentation of a new bearskin to the celebrated Manneken Pis statue in Brussels.

This seventeenth-century bronze

near the Grand Place is dressed commemoratively every

September 3 in the uniform of

a regimental sergeant-major of the Welsh Guards. The band and

corps of drums than beat

retreat in the Grand Place.

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THE TIMES

BUSINESS NEWS

SKF
world leader in rolling bearings
SKF (U.K.) Limited

17 oil companies link up to build £200m pipeline network to Shetland

By Roger Vieilvoeux

Energy Correspondent

More than half of Britain's oil requirements in 1980 could be flowing from a single undersea pipeline linking five large oilfields in the northern part of the North Sea to the Shetlands.

Seventeen oil companies from five separate exploration groups yesterday signed an agreement to jointly participate in a £200m transportation system to get the oil ashore.

Immediately after the signing, Mr Peter Baxendale, a managing director of the Royal Dutch Shell Group, one of the oil companies involved, gave a warning that government participation in the North Sea could slow down the development of the newly found off-shore oil riches.

Mr Baxendale said the Government had not discussed direct participation in the pipeline. On the Government's proposals for taking a 51 per cent stake in existing oil finds, he said he could see no way in which participation by Whitehall would speed up North Sea development and he was worried that it might slow down operations.

His concern about the slowdown in development work stemmed from the difficulty that the British National Oil Corporation would find in setting up a fully competent technical body that could operate on equal terms with their oil company partners.

Oil groups were well aware of the difficulties since they were competing among themselves for the small band of people with the experience and expertise to undertake North Sea development work.

Funelling in North Sea oil to Shetland, page 17

State boards disagree over Bacat charges

By Peter Hill

Two "nationalized" undertakings are locked in dispute over the operation of the barge-boat-catamaran (Bacat) service between Hull and Rotterdam which is already the subject of an unofficial blocking by 2,000 dockers at Hull.

The British Waterways Board, which is involved in the operation of the service with Bacat (UK) has lodged a joint submission with the National Ports Council over the charges being levied on the service by the British Transport Docks Board.

It is expected that the National Ports Council will now have to convene an inquiry into the dispute under the terms of Section 31(2) of the Harbours Act, 1964.

The service, which cost £2m to establish seven months ago, involves the use of barges which are loaded at canal ports in south and west Yorkshire and then pushed by tug to Hull for loading on board the mother ship at a riverside berth at Hull.

The service saves both cost and labour and has been handling about 5,000 tons of cargo a week between the Humber and Rotterdam.

According to the BWB, the docks board has decided to levy dues on the Bacat barges which do not require a crew and do not have their own

engines, as though they were sea-going vessels. This definition is strongly disputed by the BWB and by Bacat (UK) which claim that the Bacat barges should be subject to the same charges as are applied by the BTDB to other inland waterway craft.

The BWB also claims that the board is levying a charge on the loading of barges on board the mother ship—or the basis that the barges are, in fact, goods. The Waterways Board considers that, if a charge is to be made, it should be on a different basis.

Shop stewards at Hull yesterday issued their first blacklist of 13 vessels that the stewards claim have close connections with the Bacat service.

The river craft named in the list are operated by the BWB, General Freight Company and Trent Wharfe.

The Bacat ship is at present in dry dock but is scheduled to return to Hull next Monday for the first time since the blocking was implemented.

Closure opposed: Trade unions at Barrow-in-Furness decided yesterday to oppose the decision to close the town's port which was confirmed yesterday by the BTDB.

The docks have lost more than £1m since 1963 and suffered a dramatic loss of traffic after the closure of the local iron works.

SOBRANIE (HOLDINGS) LIMITED

Further Progress in a Difficult Period

The 36th Annual General Meeting of Sobranie (Holdings) Limited was held on September 2 in London. The following are extracts from the circulated statement of the Joint Managing Director, Mr. Charles C. Redstone:

The fortitude and determination of the British race is reflected by our refusal to go under—despite all the efforts of our governments, seers, and sages to put us under and keep us there with a boot-hock!

Each year I harp back to my previous year's speech. Last year I remarked—as I have done previously—that notwithstanding all the difficulties, all the pitfalls, all the hurdles, all the trip wires, we had nevertheless managed to do better than in the previous year.

Last year our turnover was £4,215,147. This year it is £4,536,152. We have increased the profit from £147,016 to £207,111, and we are—thanks to the kindly benevolence of the Chancellor—increasing the dividend by a fractional percentage, but not enough to set our shareholders on the road to decadence and ruin.

Tobacco Division: This segment of our business produced substantial increases both in the United Kingdom and overseas, both under our Balkan Sobranie, our Sobranie, Sullivan, Powell and non-branded trade marks. We have now established a new marketing company in the U.S. with a substantial and respected cigar manufacturer and the first few months have been most encouraging. This will, we are sure, assist us to hold and improve on our position in the U.S. as the leading manufacturers of British quality pipe tobacco. And, gratifyingly, our sales of Sobranie Luxury Cigarettes in the U.S. show continuing signs of satisfactory increase.

Laundry and Dry Cleaning Division: Trading in this area is, if anything, more difficult than in the tobacco segment. Wages have increased substantially, in an industry which is labour intensive and other costs, such as fuel, oil and water, have leapt up alarmingly. We are engaged in a large-scale rationalization of the Laundry Division, with an eye on the return we receive for the capital employed. We have, I am pleased to say, increased our business in liner hire and providing services to the hotel and catering trade.

Outlook: The current year may well prove to be probably even more difficult to cope with than the last, better as we are by rip-racing costs and a predatory Government. The outcome is unpredictable, but you can be assured that we will do our best. We retain the good fortune of first-class staff willing to help.

Mr Shore visits Venezuela after Brazil talks

Caracas, September 2—Mr Peter Shore, Britain's Trade Minister, will meet with Venezuelan government officials this week to discuss increasing trade between the two countries.

Mr Shore arrived from Brazil, where he had similar discussions with Brazilian government officials. He said the main purpose of my trip is to seek ways of increasing the economic relations between Britain and Venezuela.

Mr Shore was due to meet Singer Efraim Schacht Aristeguieta, and the Foreign Minister, and Señor Manuel Pérez Guerero, Minister of State for International Trade relations, today.

He is also invited to visit Venezuela's steel industry tomorrow, and on Wednesday he will meet the Development Minister and Minister of State for Planning and Development—AP—Dow Jones.

£2.8m share for San Paulo in compensation

San Paulo (Brazilian) Railway yesterday estimated that its share of the £4.3m compensation for nationalization agreed by the Brazilian Government to settle claims from six British companies would amount to 93p a share or almost £2.8m. This will be increased by 75 per cent of the investment currency premium applicable to the sum.

Financial Editor, page 17

£10m dispute ends after Chrysler's pay deal

By Clifford Webb

Mr Baxendale said he hoped that the development of the oil terminal at Sullom Voe could be achieved without disturbing the community life of the islands. Once the construction of the terminal was complete it would only require an operational staff of 50 to 60 people.

The oil groups had been having talks with the Zetland County Council.

"Discussions which I anticipate will shortly reach a fruitful conclusion will result in arrangements for collaboration between the council and the companies for the management of the terminal," he said.

Shell and Esso are also negotiating with the British Gas Corporation to sell the large amounts of natural gas that have been found in association with oil in the Brent reservoir.

None of the other four fields will have a commercial oil/gas ratio.

Deliveries of gas from the Brent field would be by pipeline to the St Fergus terminal near Peterhead, Aberdeenshire, where Fugis gas will be landed.

Shell and Esso each have a 34.19 per cent interest in the system. The other participants are: Texaco (5 per cent); Conoco, Gulf and the NCB (3.91 per cent each); Signal Oil and Gas (2.24 per cent); Champiin Petroleum and Santa Fe Minerals (2.1 per cent each); United Carbo (1.87 per cent); Amoco and the Gas Council (1.43 per cent each); Mobil (1.11 per cent); Amoco Hess (1.01 per cent); Tricentral (0.93 per cent); Norsk (0.58 per cent); Charhouse Securities (0.09 per cent).

Funnelling in North Sea oil to Shetland, page 17

Mr Benn affirms top priority for takeover of Court Shipbuilders

By Peter Hill and Maurice Corriveau

Mr Anthony Wedgwood Benn, Secretary of State for Industry yesterday brushed aside Conservative threats to nationalize the shipbuilding and associated companies in the Court Shipbuilders Group.

No details were given of any revision of Mr Benn's original—and now obsolete—formula for the takeover, which involved a consideration of £16m and a rearrangement of various forms. Work within the department had advanced considerably before the collapse of Court Line.

Amid rumours that suppliers to the shipyards are becoming restless about their bills, his department issued a joint statement with Court Line's special manager, Mr Rupert Nicholson, affirming that a sale to the Government is being given top priority.

The aim is to conclude a deal before the next General Election, which has been an important factor in creating uncertainty among suppliers as well as the 9,000 workers employed by Court Shipbuilders.

In their statement, the Government and Mr Nicholson said that detailed negotiations were now in progress for the purchase by the Government of £2.28 a week up to 40p for top grades.

The strikers had demanded £4 a week more than the company's original offer to give workers at Chrysler's Coventry assembly plant. The company has promised parity throughout the United Kingdom by 1976.

Production of the plastic components used on all Chrysler cars resumed immediately after the return to work vote yesterday. A company spokesman said there would be a phased recall of the 9,500 workers laid off at the Ryton, Coventry and Linwood, Renfrewshire, car assembly plants, but it would be some days before they were all back at work.

British Leyland now face the prospect of more lay-offs to swell the 16,500 already idle at Longbridge, Cowley, Castle Bromwich, Abingdon, Swindon and Linzell. Shop stewards representing the 2,000 transmission workers on strike are meeting management on Thursday to try to press again for an increase on the 24 a week offer.

The company has so far rejected a suggested approach to the Government's new conciliation and arbitration service because it believes it is too early for outside intervention.

There was better news of a smaller strike within the group. Eighty inspectors at the Alvis military vehicle factory at Coventry voted to end their two-week strike which has made a further 1,500 workers idle. The stoppage also threatened production of Rover 3500 models through lack of engine components.

The decline in capital investment is proving a good deal sharper than expected by the National Institute in its latest Economic Review—which foresees a drop in company investment of a little over 2 per cent between the fourth quarter of 1973 and the second quarter of 1974.

The latest figures from the department confirm the lack of confidence in company board-

the court a scheme which would result in the Department of Industry acquiring as going concern all the shipbuilding, ship-repairing, and associated companies in the Court Shipbuilders Group.

This seems ambitious, apart from any political considerations connected with any election date, given the protracted negotiations involved in the Rolls-Royce affair, when Mr Nicholson proved himself a tough and independent negotiator in protecting creditors' interests.

The negotiations now taking place are very complex. Court Line's inter-company indebtedness greatly reduces the cash benefit from a state acquisition on a net basis.

Although it is not the special manager's worry, the Government is aware that, apart from agreeing purchase terms, it will have to provide very substantial loan capital, because the modernization schemes now being implemented by Court Shipbuilders especially—that for the liquidation seems aimed at a complete sale of the shipyard, rather than considering any offers from any other interested parties (such as Tate and Lyle, which is interested in buying the profitable Appleford yard in North Devon).

It is understood that Mr Benn and Mr Nicholson hope to work out the final details for court approval in a matter of weeks.

In contrast, provisional figures published yesterday in *Trade and Industry* for the fixed capital expenditure of manufacturing, distributive, service and shipbuilding industries and for the physical increase in industry's stocks, all seasonally adjusted at 1970 prices:

£m Investment Total Mfing Stocks

1971 4,137 1,986 -78

1972 4,206 1,802 -153

1973 4,438 1,920 +647

1972 Q1 1,038 477 -61

Q2 1,047 447 -67

Q3 1,039 438 -49

Q4 1,081 440 -25

1973 Q1 1,134 474 +189

Q2 1,042 468 +215

Q3 1,113 486 +96

Q4 1,150 501 +148

1974 Q1 1,102 524 -165

Q2 p 1,066 515 +165

f: Provisional

rooms about current economic prospects.

The reduction in capital investment by manufacturing industry—of which is the most

important component in total spending—was, however, less sharp than for other sectors in the second quarter, declining 2 per cent to about £151m, compared with the first three months of the year. It remained above the level of capital spending in all quarters last year.

In contrast, provisional figures indicate that the distributive and service industries (excluding shipping) spent 5 per cent less in April-June than in January-March, at £468m. Expenditure on vehicles by these industries has fallen by over 8 per cent, and on plant and machinery by over 10 per cent, in the first six months of this year.

In fact, the level of spending by manufacturing industry appears to be holding up moderately well in the context of the dismal survey of investment intentions conducted by the Department of Industry last April and May.

This indicated a sharp loss of confidence among manufacturers and a sizable scaling down of capital spending plans.

As such plans have to be made many months in advance, there is every likelihood that the reduction in expenditure this autumn will be commensurately greater.

W German surplus down

Frankfurt, Sept 2

West Germany's basic payments surplus in July declined to 735m marks (about £120m) from 973m marks (about £160m) a year earlier, Deutsche Bundesbank figures showed today. The July surplus was 715m marks (about £12m).

The basic balance, regarded as the best indicator of West Germany's payments position, covers only the current account and long-term capital movements.

The overall payments balance

was 1,410m marks (about £230m) in deficit in July against a deficit of 361m marks (about £56m) in June and a surplus of 4,840m (about £800m) a year earlier.

The current account for July showed a surplus of 1,559m marks (about £23m).

The overall payments position in the first seven months was 1,751m marks (about £284m) in surplus against a surplus of 20,220m marks (£328m) a year earlier. —AP-DJ.

German plant for China

A spokesman of Demag confirmed yesterday in Duisburg

reports from Peking that a West German consortium had

won a DM150m (about £24m)

order from China for a continuous casting process steel plant.

Demag, one of the consortium, said the contract was signed in Peking over the weekend.

Odham's inquiry head

Mr Michael Foot, Secretary of State for Employment, has appointed Professor George Thomason, Professor of Industrial Relations, University College, Cardiff, to head the committee of inquiry into the dispute at Odham's (Watford).

SCHOOL FEES AHEAD?

Save & Prosper can help you reduce the burden of school fees through two new school fees plans.

UK in line for £3m tool orders from Brazil

By Arthur Reed

Air Correspondent
Despite a major sales drive by the British aircraft industry, the second level of British aerospace stole the limelight at the Farnborough Air Show yesterday.

Britten-Norman, the light aircraft company based in the Isle of Wight, announced a new order for 100 of its Islander, 41-seat airliners, worth a total of £5m.

The buyer is the Republic of the Philippines, which will use the aircraft, some of them equipped with floats, to link the thousands of small islands which form the republic.

Britten-Norman, now part of the Fairley Group, claimed at Farnborough yesterday that its sales of Islanders, now exceed

ing 650, are higher than any other previous sales record for a multi-engined commercial aircraft in British aerospace history.

A second small British aircraft company which is delighted with the way in which Farnborough is turning out is Short Brothers and Harland, the Belfast-based manufacturer of the new 30-seater airliner, the Short SD 3.30.

In spite of all the pressures against smooth production in Northern Ireland at present, the SD 3.30 made its maiden flight on August 22, three weeks after it was scheduled.

Shorts has already announced three firm orders to a third-level operator in the United States, and can be expected to announce further orders tomorrow.

A total of 30 are in the sales pipeline, towards the 100 which are needed for the Government to keep its options open on the £4.5m it has put into research and development on the 3.30.

Mr Dan Haughton, chairman of Lockheed, was at Farnborough yesterday in his usual optimistic mood about the future sales prospects of his Rolls-Royce-powered TriStar aircraft.

Asked about the chances of success in the deal which has been formulated under which the American Textron Company will virtually take over, he said: "I am bullish about it."

Under the terms of the deal, Mr Haughton has until December to sell an additional 45 TriStars.

Inexpensive aids to productivity in clothing trade

By Peter Hill

Investment by independent steel producers is being held back because proposals could be included in the proposed National Enterprise Board's shopping list.

This was claimed yesterday by Mr Michael Marshall, the Opposition's link spokesman on the steel industry, after visiting independent steel and wire manufacturers in the Sheffield and Doncaster areas.

He said: "I have encountered

"grave disputes" about the prospects of further nationalisation.

Talks in which Mr Anthony Wedgwood Benn, Secretary of State for Industry, had taken part in June in Brussels indicated that he wished to restrain the activities of the

independent steel companies. If present EEC fair competition rules inhibited him, he intended to extend the state monopoly by further nationalisation.

Mr Marshall, in a statement, said the independent producers—who account for about one-third of Britain's finished steel output by value—were directly affected by the Government's White Paper on industrial policy.

"Planning agreements would put an intolerable strain on more small and medium-sized companies, but it is the National Enterprise Board which is having the most immediate and dangerous impact," he said.

Private steelmaking investment through the capital market had effectively dried up

and the side cost less than £150 to produce, including materials and labour, and many were below £50.

"Low Cost Work Aids for the Clothing and Garment Industries, £250 from Neddle Books.

Air traffic control advances at Farnborough

Computer news

Significant advances in the application of computing to air traffic control in both Britain and the United States are being demonstrated at the international air show at Farnborough this week.

A new Marconi concept in distributed computing is to be implemented at the Scottish air traffic control centre at Prestwick; while the American authorities have selected Burroughs to provide the next stage in the national plan to automate air traffic control in the United States.

For the Prestwick centre, Marconi Radar Systems is to supply a system based on 33 of the company's recently announced Locus 16 processors. This contract, placed by the Civil Aviation Authority, is worth almost £1.5m.

Information on the position, height and identity of aircraft

flying over Scotland will be passed from radar sites (in Scotland, Northern Ireland and northern England) via telephone lines to the Prestwick centre.

This information will then be evaluated by four of the Locus processors and passed to 29 display units, each of which is driven by a single Locus. Twenty-five of these are operational displays used by the air traffic controllers.

This "distributed" approach to the processing of the radar data and the presentation of aircraft information on the controllers' display screens is an alternative to the use of a large central computing system where

all the processing is concentrated in one place.

Mr John Sutherland, managing director of Marconi Radar Systems, said yesterday at Farnborough that more than 60 Locus processors had been sold to date.

On the United States Federal Aviation Administration stand Mr Charles Dowling of the FAA reported that Burroughs had been chosen to supply computer-based systems for over 70 airports in America. This followed an experimental system supplied by Lockheed.

These are airports which require relatively modest levels of automation. In some of them the controllers' displays will be readable in daylight in the control tower "cab" (from where the controllers view the airport) and will not have to be in special radar control rooms.

This program known as

Kenneth Owen

Automated Radar Terminal System (ARTS) 2 represents the third phase in the automation of air traffic control in the United States. The two other phases have already been implemented; they cover on-route flying and flying within a 60-mile radius of the major airports respectively.

For on-route control, large IBM 9020 computer systems (similar to that now being installed at West Drayton) are used at 20 regional centres across the country.

For terminal control at 61 of America's busiest airports, Univac systems have been installed under the ARTS-3 programme. These give more comprehensive processing than will be provided by ARTS-2; both systems are designed on a modular basis to accommodate future improvements.

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For terminal control at 61 of America's busiest airports, Univac systems have been installed under the ARTS-3 programme. These give more comprehensive processing

BY THE FINANCIAL EDITOR

Lloyds: no bank is an island

The last thing Lloyds—or any major British bank—wanted was a reminder that they, too, are vulnerable to expensive "irregularities", however conservative their policies and however rigid their safeguards. The fact that the share prices of the other clearers fell by nearly as much as Lloyds itself yesterday underlines the point. Whether or not analysts now set about downgrading their 1974 earnings forecasts, they have at least received a painful reminder of the poor quality of earnings which can be eroded so easily.

By responding so quickly once the situation was exposed, Lloyds has probably minimized the damage to its reputation in Switzerland and elsewhere, though some loss of goodwill is inevitable. Yet if the same lessons for Lloyds, so there are for the banks with which its Lugano branch dealt. The inability of the international banking community to operate the checks and balances necessary to keep its collective house in order has been exposed again; and that is bad news for all banks everywhere.

Foreign bids

Little overseas interest

If anyone benefits from the plunge in the stock market, it is the large, cash-rich company that suddenly finds that it can acquire additional manufacturing capacity on the cheap. Some are already doing so. But to date there has been little overseas interest in buying United Kingdom companies and as far as United States buyers are concerned, the reasons could well be technical as well as fundamental.

"G. D. Searle's paper offer for Gold Cross Hospital Supplies provides an obvious case study. Four months after the original offer the formal documents are still not out and are not expected for at least another month. The reasons for the delay are worth examining.

Searle opted for a paper bid in order to take advantage of the Security and Exchange Commission's regulations that permit "pooling" or merger accounting in certain tightly circumscribed circumstances. This avoids the necessity of writing-off goodwill on acquisition against earnings over a period of 40 years—standard United States accounting practice after a cash bid.

The first major hurdle was overcome by obtaining the Gold Cross directors' acceptance. But Searle still runs the risk of depressing its own share price as British holders see Searle's paper to avoid paying the dollar premium whose nominal rate is now over 60 per cent.

The SEC's documentation requirements, meantime, are formidable. Full accounts up to June 30 must be produced by both companies adjusted to conform with United States accounting principles, which goes some way to explaining the delay in producing the documents. And then there is the problem of obtaining 90 per cent acceptance to satisfy the SEC's pooling requirements.

Irrevocable acceptances have admittedly been received from 44.4 per cent and the flotation was recent. But that could still leave a residue of small shareholders who are unlikely to be happy about a bid in United States paper. Cash underwriting is not permitted under the SEC's rules since the American metaphysic of pooling assumes that the merged enterprise must initially be owned by the shareholders of the original companies; to preserve the fiction the small shareholder must be left

to make an individual choice. Arrangements are probably being made, then, whereby shareholders will be given the chance to assign their shares to an independent United States stockbroker with a minimum of administrative trouble.

By the time these hurdles are overcome, there is still the risk that parity and share price fluctuations will have upset the arithmetic of the original bid.

Or again that Searle will have

plenty of time to ask itself whether it is still prepared to offer £7m worth of paper for net assets of £1m, goodwill of £1m and a one year profit forecast which gives rise to a double figure earnings multiple.

With the shares of Gold Cross at 360 against a bid value of 540 before selling expenses the stock market clearly has its doubts. And United States companies looking for cheap United Kingdom earnings and assets have been warned.

House of Fraser

Bucking the trend

What stands out in the House of Fraser figures for the six months to July 27 is that the group is gaining market share from the other department store groups, with Debenhams perhaps the most obvious victim. Turnover, adjusting for acquisitions, chiefly Army & Navy, is up by 17 per cent, about 10 points ahead of the sector as a whole.

Hard selling of specialist merchandise lines bought in bulk, particularly TV sets, and a fair degree of price cutting are largely responsible for the gain. But pressure on margins from overheads as well as Fraser's own policy decisions have resulted in the pretax profit dropping 44 per cent, and probably about 11 per cent if the acquisitions are excluded.

An additional factor has been the loss of the top slice business at Harrods and associated stores due to the fall in the number of free-spending United States tourists.

As for the remainder of the year, the hope or even expectation is that the £14m profit seen in the second half of 1973 will be repeated if not slightly improved upon. If so, the total for the year would be within a whisker of last year's £20.9m. Here, with the share at 45p the prospective p/e ratio of 51 and yield of 12 per cent should go some way in the restoration of the group's market image after the unsatisfactory affair with Boots, aided by the thought that Carter Hawley Hale may in due course buy out the remaining 70 odd per cent, though at this stage the American stores group firmly declares that it has no such intentions.

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Samuel's sales of gold, silver and diamond jewelry were exceptionally good in the first half and remain so. As with Johnson Matthey last week, the assumption here must be that investment considerations are underpinning demand. The pattern is after all hardly typical of the general trend in consumer durables.

Sales were probably helped, too, by the fact that Samuel regards its long stocks of gold and other precious metals as a buffer against any rapid increase in the selling price of jewelry. Just how prudent this policy will prove in the light of recent gold price movements remains to be seen, but it seems unlikely that extra cash flow will fully cover increased working capital requirements unless the gold price falls.

Fortunately, Samuel's liquidity is extremely healthy as of the last accounts and, judging by a rise from £107,000 to £294,000 in first half investment income (on money market deposits), it remains so. New branch openings or renovations—nine in the first half and around six in the second period—will make some impact on liquidity but Samuel seems to be in the happy position where the prospective return still justifies the investment.

Samuel is projecting the continuance of a firm sales trend throughout this year. This scenario looks possible though a winter rise in unemployment could upset the Christmas picture and a further contraction in the money supply would have obvious implications. However, the shares should not underperform the market in the short term. At 112p for the ordinary and 103p for the "A" the p/e ratio for both groups is around 43 on the basis of latest 12 months earnings. The yield is approaching 7 per cent, assuming a maximum increase in the dividend.

Interim: 1974/75 (1973/74)

Capitalization £5.4m.

Sales £134m. (F108m.)

Pretax profits £6.53m. (£5.87m.)

Dividend gross 1.87p (1.68p.)

House of Fraser

LIMITED

Interim Statement for the 26 weeks to 27th July, 1974

The unaudited results of the operations of the Group, excluding Associated Companies, for the 26 weeks to 27th July 1974 are set out below with comparative figures for the 26 weeks to 28th July 1973 and the audited figures for the 52 weeks to 26th January 1974.

	26 weeks to 27th July 1974	26 weeks to 28th July 1973	52 weeks to 26th January 1974
Turnover	£133,708	£108,131	£259,035
Included in turnover	10,363	5,708	16,722
Trading Profit	8,886	8,699	24,484
Less: Interest paid less received	1,347	1,028	1,953
Less: Depreciation	7,539	7,671	22,531
Group Profit before Tax	6,533	6,870	20,659
Less: Corporation Tax	3,397	3,320	9,216
Net Profit	3,136	3,550	11,443
Less: Preference Dividends	16	16	32
Attributable to Ordinary shareholders	3,120	3,534	11,411
Earnings per share	2.57p	3.24p	10.13p

Corporation tax for the period has been calculated at 52% (1973—51%) at a composite rate of 49.33%). The earnings per share have been calculated on the 121,508,602 ordinary shares of 25p in issue throughout the period (1973—109,039,852).

Total turnover for the period showed an increase of 23.65%. Adjusting for new acquisitions and closed stores the increase in comparable figures is 17.06%. Because of continued legislative restriction of margins and increased overheads it has regrettably not been possible to maintain the net profit in spite of the substantial increases in turnover achieved. Every effort will be made to increase turnover still further but until there is some easing of the control of margins it will become increasingly more difficult to absorb continually rising costs.

Interim Dividend on Ordinary Shares
The Directors have declared an interim dividend on the ordinary shares on account of the year ending 25th January 1975 of 1.25 pence per share (1.125p) absorbing £1,518,858 (£1,366,972). Warrants will be posted on 12th December 1974 to shareholders on the register at close of business on 4th October 1974. The transfer books will be closed for the period from 7th to 19th October 1974 both dates inclusive.

THE ANGLO-INDONESIAN PLANTATIONS LIMITED

Highlights from the directors' report and statement of the Chairman, Mr. Michael Nightingale, O.B.E.

- Group profit for the year ended 31 December 1973 £123,794 (1972 Loss £29,579).
- Interim dividend of 7% paid for 1974. A final dividend anticipated.
- 736,503 kgs tea and 727,898 kgs rubber manufactured by the subsidiary during the year 1973 to show a profit of some £60,000.
- Board proceeding with development of 2,500 ha. of rubber in North Sumatra.
- Company has ample cash with which to invest in industrial projects both inside and outside Indonesia.

Annual General Meeting at 37 Queen Street, E.C.4, at noon, Tuesday, 3 September, 1974.

LRC INTERNATIONAL LIMITED

GROUP HIGHLIGHTS for the year ended 31st March 1974

		increase over previous year
Sales in the UK*	£27.5 m	8%
Exports from the UK†	£9.3 m	15%
Sales by Overseas Subsidiaries	£16.9 m	16%
Profit before taxation*	£5.0 m	3%
Dividends to Shareholders	£1.1 m	
Retained in the business	£1.3 m	
Basic earnings per share	6.3p	

*Adjusted for profits and sales of wines and spirits division

†Includes £2.5 million to overseas subsidiaries

Copies of the Annual Report and Accounts and the Chairman's Statement can be obtained from the Registered Office:
North Circular Road, Chingford, London E4 8OA.
The Annual General Meeting will be held in the Abacora Room, Great Eastern Hotel, Liverpool Street, London EC2P 2AN on Thursday, 26th September, 1974, at 12 noon.

FINANCIAL NEWS

Trail of disputes militates against better times for Mersey Docks

By Ashley Draker

Reporting a loss more than halved in the first six months of 1974, Merseyside's tarnished image is further accentuated in the accompanying statement from Mr J. J. Page, chairman of Mersey Docks & Harbour Co, which refers to a loss of £1m a year from the Royal Seafarers Docks in Birkenhead, and an "expected substantial" full-time loss for the year.

The loss for 1973 was £2.51m, after crediting a grant of some £1.65m from the Department of Industry for losses on merged cargo handling operations.

Though there was some improvement in the quarter to March 31, a loss of £854,000 was incurred, while that to end-June was kept in check by the oil

crisis and, for a while, the shorter week. Since then the dispute at Stanlow oil refinery has meant substantial tonnages of crude oil being lost to the port. Added to this, operations were severely curtailed by the unofficial strike by engineering maintenance staff for over two months to August 19.

Mr Page estimates that this strike resulted in a loss to the company of some £2.5m, with the further complication of affecting confidence of customers and thus damaging trade prospects.

Apart from these mishaps, the new grain terminal at Royal Seafarers Dock has not been opened in spite of all efforts. The company, therefore, has requested an independent inquiry to resolve this dispute, particularly in view of the

heavy losses being incurred. Generally, prevailing uncertainties in inflation, world trade and industrial relations, make a full-time prediction impossible, though a big loss is likely.

In the half-year past, operating revenue rose from £15.38m to £20.99m. Meanwhile, application has been made to the Ministry for further grant regarding losses in the three months to December 31, 1973, not exceeding £712,000. No credit has been taken for this grant, or any other, for losses in 1974.

On the capital reconstruction scheme (effective on March 27), as from March 23 total interest payable on stocks has been about 39 per cent (against 70 per cent) of former contrac-



Mr. G. W. Brimley, joint managing director of Mersey Docks and Harbour Company.

J. Cash says 'no' to approach by Jones Stroud

J. & J. Cash, a public listed company best known for its woven and printed labels, has given short shrift to the Jones Stroud (Holdings) offer. The board calls the £1 a share cash bid "wholly inadequate"; in their view it undervalues both the assets and earnings potential.

The directors add that a comprehensive programme of rationalisation and development is now well advanced, and they advise shareholders to take no action on the offer.

Jones Stroud last week revealed that they had acquired a 35.3 per cent in the issued share of Cash at 100p a share

Mr Slater is taking charge at Lubok with cash injection

by Tony May

In an agreed deal announced last night, Mr Jim Slater re-enters the takeover scene. He and his associates are to pay £689,982 in cash for what will be half the equity of Lubok Investments. The Lubok board has agreed to issue 6,571,257 shares subject to the approval of shareholders.

The price is equal to 10.5p—the net asset value of the company at August 31. This compares with a spread of 8p-to-18p in the Official List.

Following completion of the deal, Mr Slater will become chairman of Lubok, the present chairman, Mr J. Rice, will become his deputy, while Mr A. Taylor, head of mining research at James Capel & Co, brokers, will also join the board in a consultative capacity.

Fitch Lovell raises £3.4m from sale of Greig shops

Having acquired David Greig, the grocery concern for £6m in cash, Fitch Lovell is busily rationalising the group and Sir Charles Hardie, the chairman of Fitch, says that about £3.4m is being raised from the disposal of "uneconomic" trading areas.

On the back of a £50m increase in turnover from £21.7m to £26.6m the group last year managed to push up pre-tax profits from £6.2m to £6.6m. The results have now have been much higher but for a prior second half in poultry, and from the Hale-Prest cake-baking division which has now been sold to J. Lyons for £1.7m.

C. T. BOWRING

Bowring Sewardian Berhad has been formed in Kuala Lumpur as general insurance broker, with company controlling 50 per cent, and rest of equity held locally.

ADVANCE ELECTRONICS

On August 30, Charles Stanley & Co bought 15,000 shares in company, for associates.

STONEHENGE BRICKS

Dividend for 1973-74 raised from 0.78p to 0.85p, and improved from £1.5m to £1.35m. Taxable profit, £67,000 (£77,200). Earnings a share, 1.22p (1.36p).

HENRY WIGFALL

Board has had to reduce its dividend for 1973-74 from 3.85p net to 3.65p net.

ROBB CALEDON Shipbuilders Ltd.

Sir John Brown, Chairman, reports on the year ended 31st March 1974.

* Group profit was £180,678. A dividend of 7.035" net is recommended (equivalent to 10.5" gross).

* Profits were seriously affected by additional provisions of £100,000 necessitated by major delays in sub-contractors' deliveries and by the ultimate effect of the three-day week.

* Three ferries and a mooring, salvage and boom vessel were among completions while two cable repair ships, an oceanographic survey vessel and the largest ever ocean-going tug are under construction. New orders include three tugs, an 11,000 ton bulk carrier and three SD.14 type vessels, the last constituting the biggest single contract ever undertaken by the Company.

* Trends in shiprepairs at both Leith and Dundee continue upwards.

* The new module building facilities for the off-shore oil industry at Burntisland have been completed and the plant is in production. The order book, which includes a substantial volume of work for export, is satisfactory.

* We are of the view that the Government's nationalisation plans are not only irrelevant to the present difficulties of the country and the shipbuilding industry but are likely to do positive harm.

Copies of the Accounts and Chairman's Statement may be obtained from the Secretary, Caledon Shipyard, Dundee DD1 3NB.



Crouch Group Limited

Main points from the circulated statement by the Chairman, Mr. R. E. Aris, F.C.A.

◆ Trading profit before exceptional item showed an increase on that for 1972/73, which year included a claim of approximately £200,000.

◆ The proceeds from the sale of land, the cost of which is written down, will materially reduce interest charges in the year 1974/75.

◆ Only 7 houses unsold two months or more after building completion.

◆ Increased availability of mortgages has improved current trading and sales.

◆ All subsidiary companies are trading at a profit.

◆ Sound financial position with surplus of assets over liabilities equivalent to approximately 90 per share.

◆ Total gross dividend 15%. Earnings per share 5.75p.

BUILDERS—CONTRACTORS—ALLIED TRADES

Copies of the report and accounts may be obtained from the Registrars, Samuel Montagu & Co. Limited, St. Olaf House, Tooley Street, London, SE1 2PL.

CJB joins Iranian venture

Constructors John Brown, the multi-national, construction offshoot of John Brown & Co, and the Mohandas Iran Co, a subsidiary of the Iranian National Oil Company, have signed an agreement in Teheran to form a new Iranian company.

It aims to take a major role in Iran's expanding industrial programme, particularly in the fields of oil, gas and petrochemicals. No financial details are disclosed.

The proposed name of the

new company is CJB Mohandas Iran, with headquarters in Teheran. The chairman will be Mr Mahmood Poozeshi, who is well known in the national oil industry and is the chairman of Mohandas Iran. Mr G. V. C. Davies, a leading figure in international construction, will be managing director.

As reported in May, Ladbrooke, subject to necessary official consents, has agreed to sell its stake for over £1m cash to trustees of the Mark Stein Settlement, which already holds over 10 per cent.

DTI aid for Gen Engineering
With financial assistance of the DTI, General Engineering (Radcliffe) has bought the plant and factory owned by T. Dryden & Sons of Preston. This will enable the group to produce the additional productive capacity to badly needed.

Mr Harry Lillicrap, C & W's chairman, has denied the allegations and defended the company's position.

Chalk works reopen

The chalk quarries and works of Superfine Chalks, Yorkshire, have been reopened following the merger of Greelf Chemical Holdings and Chemical Securities. Superfine will operate as a division and production has already restarted. It is also intended to install new equipment to increase its present capacity, as there are some million tons of high quality chalk reserves available.

Hume Inds (Far East)

On turnover up from £51.4m to £57.1m preliminary net-tax profits of Hume Industries (Far East) are ahead from £8.04m to £12.8m. After allowing for £1.26m (against £58.000) applicable to outside shareholders, and extraordinary items of £83,000 (nil), net profits amounted to £5.7m (£3.8m). Two interim dividends of 5 per cent had been declared.

Cosalt-Orbit

The full offer document concerning the proposed merger of Cosalt with Orbit Holdings has now been sent to shareholders. The principal advantage of the merger for Orbit shareholders is the securing of an enlarged borrowing base as a result of which it should be possible to raise the finance needed to develop the activities of the Orbit group particularly in banking.

Mr. J. E. Stirlane is joining the main board of Bonsor Engineering.

Mr. R. Bates is taking over as chairman of Cray Electronics.

Chairman of Woolcomers

Chairman of Woolcomers (Holdings) reports that the first few months of trading in the current year have resulted in a good flow of deliveries to customers although hesitation to

Wall Street, and other United States cities, were closed yesterday for Labor Day.

FINANCIAL NEWS AND MARKET REPORTS

Stock markets

Stronger performance from gilts

The gilt edged market turned higher yesterday following reports from the Federal Reserve authorities that may relax monetary policies to fight recessionary trends. But a cautious rally in equities was wiped out in late dealings by the disclosure of a substantial loss on foreign exchange dealings at a continental office of Lloyds Bank. International Banking shares fell heavily at the end of the session, with Lloyds Bank finally 18p off at 127p.

With the hints of a change of monetary policy in the United States receiving some encouragement from Friday's fall in United States treasury bill rates from their peak levels, gilts were in better form. The market also showed the likelihood of an election season will bring more determined political action against inflation in the United Kingdom.

But buyers remained cautious, and most of the business was done at the shorter end of the market, where prices moved forward by as much as

4 of a point. Prices were fully held at the close. Dealers described the buying pressure as "fairly good".

At the longer end, gains ranged to around 4 of a point, but turnover was thin. Here also, the best prices were held at the close, with the market little affected by the Lloyds announcement.

The new account in the equity market showed every sign of making a cautious start, and share prices were little changed from overnight levels at the end of the first hour. But as news of the improvement in gilts filtered through prices began to turn higher.

Another helpful factor appeared at midday when 17 major oil companies announced agreements to provide delivery systems for North Sea oil. But progress in equities was slight, and sheer lack of business clipped back some of the earlier gains. The disclosure from Lloyds Bank badly upset the market during the final hour's trading. While the market realises that the losses are relatively minor for Lloyds itself, the news has revived some of the fears of

further cash problems in the financial sector. These fears drove market indices to 15-year lows only a week ago.

Shares in Lloyds Bank fell to 127p, rallied to 136p, but then fell back again in nervous trading to close a net 18p off at 127p. At 152p, Barclays Bank lost 13p, Midland Bank (170p) shed 10p and National Westminster Bank (142p) were finally 15p off.

Some of the secondary banks were also unsettled. At 68p, Keyser Ullmann went at a new low, with the loss over the past week now extending to 12p. Minor falls were suffered by Slater Walker Securities (90p), and Kleinwort Benson (53p), and Free Brand (22s).

Industrial shares remained cautious ahead of reports late this week from several major companies to 100 in the oil price. Gains ranged to 10p, and more in Vast (22s) and

Free Brand (22s).

Gold shares had a good session

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Commodities

Tin hits peak of £4,140

Standard tin (cash) closed £42.50

higher yesterday at £4,112.50

Standard (three months) was £35

down and high-grade (also three

months) was £40 lower.

Standard tin (cash) closed £4,140

higher yesterday at a record £4,140

a tonne on the LME. This peak

was a direct result of the technical

shortage in nearby supplies of

metal which has dominated the

market recently and which became

particularly acute last week.

Gold had a good session

as the price of higher bullion

prices rose. Gains ranged to 10p,

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Bank badly upset the market during the final hour's trading. While the market realises that the losses are relatively minor for Lloyds itself, the news has revived some of the fears of

was done on a private treaty basis through brokers on the Commodity Exchange floor.

The new market, run roughly on Settlement House lines, will now be run by the International Commodity Clearing House, who will now take over all responsibilities connected with the registration of contracts.

The contract, quoted in pence per kilo, is based on the international ribbed smoked sheet card, quality No 2, tender points in London, Liverpool and Avonmouth.

SUGAR futures held steady for most of the day, ending 10p lower on the day average, 72.00c, or 2c-day.

SOYBEAN oil futures held steady for most of the day, ending 10p lower on the day average, 72.00c, or 2c-day.

SOYBEAN meal futures closed 10p higher on the day, ending 10p lower on the day average, 72.00c, or 2c-day.

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London and Regional Market Prices **Bank shares weak**

ACCOUNT DAYS: Dealings Began, Sept 2. Dealings End, Sept 13. § Contango Day, Sept 16. Settlement Day, Sept 24.

§ Forward bargains are permitted on two previous days.

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SOUTHERN

10.00 am. Thanes. 12.00, Southern News. 12.05, Southern 2.30, Houseparty. 3.00, Thanes. 5.50, Crossroads. 6.00, News. 6.00, Day by Day. 6.35, Survival. 7.05, Thanes. 7.35, McCloud. 8.30, Thanes. 11.00, Southern News. 12.10, am, Weather. Guideline.

11.20-11.50, News Extra.

YORKSHIRE

10.00 am. Thanes. 6.00, Crossroads. 6.30, News. 6.01, Report West. 6.15, News. 6.28, Crossroads. 6.30, News. 6.00, Day by Day. 6.35, Survival. 7.05, Thanes. 7.35, McCloud. 8.30, Thanes. 11.00, Southern News. 12.10, am, Weather. Guideline.

11.20-11.50, News Extra.

ATV

10.00 am. Table Tennis. 10.25, European Athletic Championships. 7.05-7.30, Physics. 7.00, Film: Play School. 5.25, Open University. 7.00, Biochemistry. 5.50, Geophysics. 6.15-6.40, Animal Behaviour. 2.15, Film: Road to Rio (1947). 2.15, Film: Crosby, Stills, Nash & Young. 12.00, Marked Personnel. 2.00, About Britain. 2.30, Good Afternoon. 3.00, Trades Union Congress. 4.15, European Athletic Championships. 4.20, Magpie. 4.50, British Athletes. 4.15, Play School. 4.35, Jackanory. 4.50, The Record Breakers. 5.40, Peter Pan. 5.15, Bonny. 5.40, Hector's House. 5.45, News. 6.00, Nationality. 6.45, European Athletics Championships. 1974. 7.20, Mission Impossible. 8.10, Sutherland's Law. 9.00, News. 9.25, Pueblo. 10.15, Weather. 11.20, Film: 74. 11.25, News. 12.05, Weather. 12.12, Weather. * Black and white.

11.20-11.50, News Extra.

Radio

1. 5.00 am. News. 8.00, Radio 1. 5.00 am. Arthur. 10.00, Thanes. 6.00, News. 6.01, Report West. 6.15, News. 6.28, Crossroads. 6.30, News. 6.00, Day by Day. 6.35, Survival. 7.05, Thanes. 7.35, McCloud. 8.30, Thanes. 11.00, Southern News. 12.10, am, Weather. Guideline.

11.20-11.50, News Extra.

BORDER

3. 5.00 am. The Rover. 10.00, Thanes. 6.00, News. 6.01, Report West. 6.15, News. 6.28, Crossroads. 6.30, News. 6.00, Day by Day. 6.35, Survival. 7.05, Thanes. 7.35, McCloud. 8.30, Thanes. 11.00, Southern News. 12.10, am, Weather. Guideline.

11.20-11.50, News Extra.

Anglia

3. 5.00 am. News. 7.00, Weber. 5.00, News. 8.00, Radio 1. 5.00 am. News. 8.00, News. 8.01, Report West. 8.15, News. 8.28, Crossroads. 8.30, News. 8.00, Day by Day. 8.35, Survival. 9.05, Thanes. 9.35, McCloud. 10.40, Eurostar. 11.00, News. 12.00, Radio 1. 12.00, Radio 1. 12.00, Radio 1.

12.00-12.30, News Extra.

Ulster

3. 5.00 am. News. 7.00, Weber. 5.00, News. 8.00, Radio 1. 5.00 am. News. 8.00, News. 8.01, Report West. 8.15, News. 8.28, Crossroads. 8.30, News. 8.00, Day by Day. 8.35, Survival. 9.05, Thanes. 9.35, McCloud. 10.40, Eurostar. 11.00, News. 12.00, Radio 1. 12.00, Radio 1. 12.00, Radio 1.

12.00-12.30, News Extra.

Westward

3. 5.00 am. News. 7.00, Weber. 5.00, News. 8.00, Radio 1. 5.00 am. News. 8.00, News. 8.01, Report West. 8.15, News. 8.28, Crossroads. 8.30, News. 8.00, Day by Day. 8.35, Survival. 9.05, Thanes. 9.35, McCloud. 10.40, Eurostar. 11.00, News. 12.00, Radio 1. 12.00, Radio 1. 12.00, Radio 1.

12.00-12.30, News Extra.

Scottish

3. 5.00 am. News. 7.00, Weber. 5.00, News. 8.00, Radio 1. 5.00 am. News. 8.00, News. 8.01, Report West. 8.15, News. 8.28, Crossroads. 8.30, News. 8.00, Day by Day. 8.35, Survival. 9.05, Thanes. 9.35, McCloud. 10.40, Eurostar. 11.00, News. 12.00, Radio 1. 12.00, Radio 1. 12.00, Radio 1.

12.00-12.30, News Extra.

International Wool Secretariat

3. 5.00 am. News. 7.00, Weber. 5.00, News. 8.00, Radio 1. 5.00 am. News. 8.00, News. 8.01, Report West. 8.15, News. 8.28, Crossroads. 8.30, News. 8.00, Day by Day. 8.35, Survival. 9.05, Thanes. 9.35, McCloud. 10.40, Eurostar. 11.00, News. 12.00, Radio 1. 12.00, Radio 1. 12.00, Radio 1.

12.00-12.30, News Extra.

Glamorgan

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12.00-12.30, News Extra.

Not All The Best Jobs Are In London

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3. 5.00 am. News. 7.00, Weber. 5.00, News. 8.00, Radio 1. 5.00 am. News. 8.00, News. 8.01, Report West.



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Deeds for cancellations and alterations to copy (except for news items) should be sent to the day of publication. The deadline is 12 noon Saturday. On all cancellations, add "Please cancel my Deed of Transfer". On any subsequent queries, copy the original Deed and add "Stop Number" must be quoted.

PLEASE CHECK YOUR AD. We make every effort to avoid errors in the classified columns. Ads are carefully checked and errors read. When we receive a copy of an ad, we handle it each day. If you spot an error, report it to the day of publication. Please mention immediately by telephoning 01-837 3311. If you are not sure that what you cannot be removed from the classified columns, telephone if you do not receive a reply.

.... I appeal to you, my brothers, to avoid sin; for it is sin which unites us, and through it—1 Corinthians 1: 10 (N.E.B.).

BIRTHS

ANDERSON.—On August 30, at St. Bartholomew's Hospital, to Joan and John, son of Mr. and Mrs. Richard, brother for Sarah.

ATKINS.—On August 30, at St. Christopher's Hospital, L.W. 2—a son, Christopher.

BEALE.—On September 1st, to Gill and Paul, son of Gill and Paul.

CAMPBELL.—On August 29, at Mount Alvernia, Guildford, to Alan and Linda, son of Alan and Linda, daughter, Lucy.

CHESTER.—On August 29, at St. Bartholomew's Hospital, to John and Ruth, son of Ruth and Christopher.

COOPER.—On August 29, at St. Bartholomew's Hospital, to John and Ruth, son of Ruth and Christopher.

GRIMES.—Our 20th white on white in Arifant, to Sally and Stephen, son of Nicholas and Gorse, a brother for Penny and Linda.

HANCOCK.—On August 29, to St. Bartholomew's Hospital, to John and Ruth, son of Ruth and Christopher.

LEWIS.—On August 29, to Christina (nee Phillips) and Christopher, a brother for Jonathan.

MCLELLAN.—On August 29, to Gill and Paul, son of Gill and Paul.

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